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COMMUNICATIONS

THE VALUE OF PENICILLIN IN THE TREATMENT OF SUPERFICIAL INFECTIONS OF THE EYES AND LID MARGINS*

BY

Major T. CRAWFORD, R.A.M.C.

and

Major E. F. KING, R.A.M.C.

Introduction

THE purpose of this investigation was to determine the clinical and bacteriological results of local application of penicillin in cases of conjunctivitis, corneal ulceration and blepharitis.

Clinically, four groups of cases were selected :

1. Conjunctivitis, of some severity, showing well-marked injection and discharge but without secondary involvement of the cornea.

2. Conjunctivitis, again of some severity, with additional secondary corneal infiltrations, either superficial and diffuse, or marginal.

3. Conjunctivitis with a single large secondary corneal ulcer or infiltration. The clinical picture was here dominated by the localised corneal infection.

4. Blepharitis, chronic in type and severe in character. All these patients were prone to frequent and disabling subacute exacerbations of the infection.

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No cases of corneal ulceration unassociated with conjunctivitis or other causative factors were available for the investigation. Such cases are commonly seen in age-groups higher than that of the services, and in specialised occupations such as coal-mining.

Certain cases in each group showed skin lesions of the face which were thought to play an important part in the aetiology of the eye condition. No specialised treatment of the skin was carried out during the investigation.

In none of the cases selected was there associated infection of the lacrymal passages. A number had received previous treatment, in some cases for long periods, but this appeared to have no influence on the efficacy of the penicillin therapy.

Methods of Investigation

The sodium salt of penicillin was employed. It was supplied to us in sterile tablets of 7,500 units each.

From these tablets two preparations were made :—

(1) Drops. These consisted of a sterile aqueous solution containing 250 units per c.c.

(2) Ointment. The base used was 30 per cent. lanette wax (SX quality) in water. Penicillin was added to this to give a final concentration of 250 units per gram.

Each batch of material was distributed in small quantities in sterile screw-capped bottles and kept frozen solid until required for use. Only one bottle of each preparation was actually in use at one time. Between treatments this bottle, though not frozen solid, was kept in a refrigerator at 0-5°C. A single bottle lasted only 1-3 days, depending on the number of cases under treatment, and no significant deterioration occurred during this time.

Routine Treatment.—Drops were used on cases in Group 1, as in these the discharge tended to be profuse. In Groups 2, 3 and 4 ointment was used. No other method of therapy was employed throughout the investigation.

The drops or ointment were instilled in the lower fornix of the affected eye at four-hourly intervals, both by day and night. The amounts used were not measured: one or two drops, and a piece of ointment the size of a match-head were the average quantities. No attempt was made to aid absorption of the preparation by iontophoresis or a corneal bath, nor did the cases of blepharitis receive any additional application to the lid margins.

Allowing for wastage in containers and pipettes and on applicators the consumption of material was at the rate of approximately 1 c.cm. of drops or 1 gram of ointment per eye per day with this procedure. This gives an average consumption of 20 c.c. or 20 grams for a bilateral case treated for ten days, and represents a total of 5,000 units of penicillin for an average case.

About one-half of the patients complained of smarting pain for some 10 to 20 minutes after instillation of the drops or ointment, but no case of damage to the corneal epithelium was noted. As a routine the penicillin was instilled for 7 days after the bacteriological cultures from the conjunctival sac had become negative. If, however, by this time the eye had not made a full clinical recovery the treatment was continued for a further 7 days. On completion of the instillation of drops or ointment all treatment was withheld and the patient was retained in hospital a further two weeks for observation. He was then sent to a convalescent home for four weeks, and from there he was re-admitted to hospital for a further examination before discharge. Thus each case was under review for either six or seven weeks.

Certain precautions were taken to prevent the occurrence of cross infection. The men were not nursed in isolation but were retained in one ward, to which no other cases were admitted. The day and night nursing staffs were particularly careful to avoid the transference of infection and were not engaged on any other duties during the investigation. The men were permitted to associate with other ambulatory patients in the recreation rooms, but were not allowed to enter other wards.

Bacteriological Methods.—Conjunctival swabs from the affected eyes were examined before commencement of treatment, daily during treatment until repeated negative results were obtained, seven days after cessation of treatment, and at various later dates. The swabs were inoculated immediately on to warm blood-agar plates and into nutrient broth. These media were incubated for 48 hours and the nature of any growth determined. Every organism isolated was tested for penicillin-sensitivity and all staphylococci were tested for coagulase production.

For swabs taken during the course of penicillin treatment special media were used in which was incorporated a preparation of penicillinase (Harper, 1943) to inactivate any penicillin carried over into the medium by the swab.

Comparative assays of the material were carried out by the cylinder technique described by Abraham et alias (1941).

Persistence of Penicillin in the Discharge.—A number of tests were made to determine the duration of penicillin activity in the discharge from the eye following the application of both drops and ointment. The capillary tube technique (Fleming, 1943) and the modified slide-cell technique (Florey and Florey, 1943) were employed, and the tests were recorded as positive if there were definite inhibition of the standard Oxford staphylococcus in the discharge diluted with an equal volume of normal human serum. These results are recorded in Tables I and II. They demonstrate the superiority of the ointment over the drops in its powers of persistence in the conjunctival sac.

TABLE I

Persistence of Penicillin in the Discharge after application as Drops

Time after application	Number of examinations	Penicillin positive	Penicillin negative
1 hour	6	5	1
2 hours	6	3	3
3 hours	6	1	5
4 hours	3	0	3

TABLE II

Persistence of Penicillin in the Discharge after application as Ointment

Time after application	Number of examinations	Penicillin positive	Penicillin negative
2 hours	4	4	0
3 hours	6	6	0
4 hours	6	4	2
5 hours	6	3	3

Analysis of Cases

Group 1.—The important clinical and bacteriological features of the cases comprising Group 1 are set out in Table III.

SUMMARY.

a. No case was encountered due to a penicillin-resistant organism.

b. All the cases were readily and completely cured within an average of 5 days.

c. Cases which had proved resistant to other forms of therapy (Nos. 1, 2, 3, 6 and 7) responded as well and as rapidly as previously untreated cases.

d. Associated skin lesions (Cases 2, 4 and 5) appeared to have no effect on the penicillin therapy.

e. Particularly encouraging were results on a severely infected socket of four years' duration (No. 6) and a severe conjunctival infection following a squint operation (No. 7).

f. One case (No. 4) relapsed clinically during the period of observation.

TABLE III.—GROUP 1. *Cases of Conjunctivitis without Corneal Involvement*

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Case	Clinical condition before treatment	Clinical response to treatment	Bacteriological condition before treatment	Bacteriorlogical response to treatment
1.—Gde. T. ...	Left conjunctivitis. Duration, 3 weeks. Similar infection in right eye two weeks previously	Cured in 3 days	Moderate growth Staph. aureus from both eyes	Swabs became sterile after 3 days. No recurrence
2.—Cfn. L. ...	Severe bilateral conjunctivitis. Duration, 2 months. Comprehensive previous treatment. Seborrhoeic dermatitis of face with entropion of lower lids	Cured in 10 days	No growth of organisms was obtained at any time in this case	—
3.—Sgt. B. ...	Right conjunctivitis. Duration, 4 weeks. Comprehensive previous treatment. Simultaneous conjunctivitis with superficial punctate and marginal keratitis in left eye. (Included in Group 2)	Cured in 4 days. (Full subsequent observation not completed)	Heavy growth Staph. aureus	Sterile after 1 day. No recurrence
4.—L.A.C. O.	Right conjunctivitis. Duration, 2 days. Simultaneous conjunctivitis with superficial punctate keratitis in left eye. (Included in Group 2) Acne rosacea of face.	Cured in 3 days. Recurrence 7 days after cessation of treatment. Again rapidly cured on resumption of treatment	Heavy growth of Staph. aureus	Sterile after 1 day. Diphtheroid bacilli appeared after cessation of treatment, and no other organisms were found at the time of the clinical relapse
5.—Pte. G. ...	Right conjunctivitis. Duration, 2 days. Left conjunctivitis with marginal keratitis 4 weeks previously. (Included in Group 2) Left otitis externa	Cured in 4 days	Moderate growth of Staph. aureus	Sterile after 1 day. No recurrence
6.—Cpl. B. ...	Subacute exacerbation in chronically infected left socket. Duration, intermittently, since excision of eye 4 years previously. Comprehensive previous treatment.	Cured in 5 days	Heavy growth of Strep. haemolyticus in pure culture	Streptococci disappeared after 2 days. Diphtheroid bacilli present for 2 days, then culture negative till 6 days after cessation of treatment when heavy growth Staph. aureus obtained. This persisted at all later examinations.
7.—Cfn. S. ...	Right severe purulent conjunctivitis following squint operation. Duration, 6 days, unsatisfactory response to usual methods of treatment	Cured in 8 days	Heavy growth of Staph. aureus	Sterile after 5 days. No recurrence

TABLE IV.—GROUP 2. *Cases of Conjunctivitis with Diffuse Superficial or Marginal Keratitis.*

Case	Clinical condition before treatment	Clinical response to treatment	Bacteriological condition before treatment	Bacteriological response to treatment
8.—Dvr. J. ...	Right conjunctivitis and marginal keratitis. Duration, 3 days	Cured in 10 days	Heavy growth of Staph. aureus, both eyes	Sterile after 2 days. Later cultures yielded only diphtheroid bacilli
9.—Pte. W....	Right conjunctivitis, superficial punctate and marginal keratitis. Duration, 6 days	Cured in 7 days	Heavy growth of Staph. aureus	Sterile after 1 day. No recurrence
10.—Gnr. M.	Right conjunctivitis and superficial punctate keratitis. Duration, 6 weeks. Comprehensive previous treatment	Cured in 7 days	Heavy growth of Staph. aureus	Sterile after 1 day. No recurrence
11.—Cpl. B.	Left conjunctivitis and superficial punctate keratitis. Duration, 2 weeks. Comprehensive previous treatment. Simultaneous right uncomplicated conjunctivitis. (Included in Group 1). Acne rosacea of face.	Cured in 6 days. (Full subsequent observation not completed)	Heavy growth of Staph. aureus	Sterile after 1 day. No recurrence
12.—L.A.C.O.	Severe left conjunctivitis and superficial punctate keratitis. Duration, 2 months. Comprehensive previous treatment. Simultaneous right uncomplicated conjunctivitis. (Included in Group 1). Acne rosacea of face	Cured in 6 days	Heavy growth of Staph. aureus	Sterile after 1 day. Diphtheroid bacilli appeared after cessation of treatment
13.—Pte. G.	Left conjunctivitis and marginal keratitis. Duration, 4 weeks. Comprehensive previous treatment. Developed uncomplicated right conjunctivitis 4 weeks later. (Included in Group 1). Left otitis externa	Cured in 7 days	Moderate growth of Staph. aureus	Sterile after 1 day. Staph. aureus appeared after cessation of treatment
14.—Sgt. B.	Left conjunctivitis and superficial punctate and marginal keratitis. Duration, 3 days. Simultaneous right uncomplicated conjunctivitis. (Included in Group 1)	Cured in 10 days. (Full subsequent observation not completed)	Heavy growth of Staph. aureus	Sterile after 1 day. No recurrence
15.—Tpr. H.	Right conjunctivitis and superficial punctate keratitis. Duration, 2 weeks. Seborrhoeic dermatitis of face	Cured in 8 days. Recurrence 2 weeks later	Heavy growth of Staph. aureus	Sterile after 1 day. Staph. aureus reappeared 2 weeks later

TABLE V.—GROUP 3. *Cases of Corneal Ulceration or extensive localised Corneal Infiltration secondary to Conjunctivitis*

Case	Clinical condition before treatment	Clinical response to treatment	Bacteriological condition before treatment	Bacteriological response to treatment
16.—Pte. P.	Right recurrent marginal corneal ulcer. Duration, 2 months. Comprehensive previous treatment	Cured in 10 days	Moderate growth of Staph. aureus	Negative after 1 day. Staph. albus appeared after cessation of treatment
17.—Pte. C.	Right recurrent marginal corneal ulcer. Duration, 4 days	Cured in 9 days	Pure growth of Diplobacillus liquefaciens of Petit, showing slight penicillin-sensitivity in culture	Sterile after 2 days. Diphtheroid bacilli appeared after cessation of treatment
18.—Pte. W.	Right marginal corneal ulcer. Duration, 2 weeks	Cured in 8 days	Cultures yielded a growth of diphtheroid bacilli only	Sterile after 1 day. No recurrence
19.—Tpr. H.	Right paracentral corneal infiltration and marginal corneal ulcer. Duration, 1 week. Seborrhoeic dermatitis of face	Cured in 9 days	Heavy growth of Staph. aureus	Sterile after 1 day. No recurrence

TABLE VI.—GROUP 4. *Chronic Blepharitis*

Case	Clinical condition before treatment	Clinical response to treatment	Bacteriological condition before treatment	Bacteriological response to treatment
20.—Dvr. R.	Non-ulcerative blepharitis. Duration, 5 years. Comprehensive previous treatment	Marked improvement in 2 weeks. Some residual erythema of lid margins	Moderate growth of Staph. aureus, both eyes	Sterile after 1 day. Staph. albus appeared after cessation of treatment
21.—Cpl. W.	Non-ulcerative blepharitis. Duration, 20 years. Comprehensive previous treatment	Marked improvement in 2 weeks. Some residual erythema of lid margins	Morax-Axenfeld bacillus from both eyes. Slightly penicillin-sensitive in culture. Staph. aureus from left eye	Sterile after 3 days. No recurrence
22.—Pte. F.	Ulcerative blepharitis. Duration, 15 years. Comprehensive previous treatment	Marked improvement in 2 weeks. Some residual erythema of lid margins	Heavy growth of Staph. aureus from both eyes	Sterile after 2 days. Diphtheroid bacilli appeared after cessation of treatment
23.—Cfn. N.	Non-ulcerative blepharitis, pustules on lid margins. Duration, 2 years. Comprehensive previous treatment	Marked improvement in 2 weeks. Some residual erythema of lid margins	Heavy growth of Staph. aureus from both eyes	Sterile after 1 day. No recurrence
24.—Pte. S.	Non-ulcerative blepharitis. Duration, 20 years. Comprehensive previous treatment	Marked improvement in 2 weeks. (Full subsequent observation not completed)	Heavy growth of Strep. viridans from both eyes: Staph. aureus from left eye	Sterile after 2 days. Strep. viridans had reappeared in both eyes 7 days after cessation of treatment
25.—Gnr. M.	Ulcerative blepha itis. Duration, 20 years. Comprehensive previous treatment. Chronic dermatitis in right eyebrow	Marked improvement in 2 weeks. Some residual erythema of lid margins	No growth of organisms was obtained at any time in this case	—
26.—Cfn. H.	Non-ulcerative blepharitis. Duration, 2 years. Comprehensive previous treatment	Some improvement in 2 weeks. Marked residual erythema of lid margins	Moderate growth of Staph. aureus from both eyes	Sterile after 1 day. Staph. albus appeared 3 days after cessation of treatment
27.—Gnr. A.	Ulcerative blepharitis. Duration, 25 years. Comprehensive previous treatment. Seborrhoea of scalp and back	Some improvement in 2 weeks. Marked residual erythema of lid margins	Moderate growth of Staph. aureus from both eyes	Sterile after 2 days. No recurrence
28.—Gnr. R.	Ulcerative blepharitis and chronic conjunctivitis. Duration, 2 years. Comprehensive previous treatment	Response during treatment disappointing. At end of period of observation improvement considerable and all ulcers healed, though still some erythema of lid margins and chronic conjunctivitis	Heavy growth of Staph. aureus from both eyes	Sterile after 1 day, but Staph. aureus had reappeared in both eyes 17 days after cessation of treatment

g. Bacteriologically, five of the cases were infections with coagulase-positive staphylococcus aureus, and one with a streptococcus haemolyticus. No organisms were isolated in the remaining case.

h. Cultures became negative after treatment for one day in three cases, and after 2, 3 and 5 days in the remaining cases.

i. There was no bacteriological relapse in this group.

Group 2.—The clinical and bacteriological features of the cases of this group are shown in Table IV.

SUMMARY.

a. No case was encountered due to a penicillin-resistant organism.

b. In all cases the conjunctival condition was cured and active inflammation in the cornea had subsided within an average period of 7½ days.

c. Four cases (Nos. 10, 12, 13 and 14) had received extensive previous therapy with inconclusive results. The response to penicillin was as satisfactory as in previously untreated cases (Nos. 8, 9 and 11).

d. Three cases (Nos. 12, 13 and 15) had associated skin lesions. All responded well.

e. One case (No. 15) relapsed during the period of observation.

f. All the cases of this group were infections with coagulase-positive staphylococcus aureus,

g. Cultures became negative after treatment for one day in 7 cases and for two days in the remaining case.

h. The clinical relapse (Case 15) was associated with the reappearance of staphylococcus aureus. The reinfecting staphylococcus was fully sensitive to penicillin.

No other bacteriological relapse occurred.

Group 3.—The clinical and bacteriological features of the cases of this group are shown in Table V.

SUMMARY

a. No case was encountered due to a penicillin-resistant organism.

b. The corneal ulcer healed and all local activity subsided within an average period of 9 days.

c. In one case (No. 16) the corneal ulcer had been present for two months. The response was as satisfactory as with those of shorter duration.

d. The one case with an associated skin lesion (No. 19) responded well.

e. No clinical relapse was noted during the period of observation.

f. Two of the cases were infections with coagulase-positive

staphylococcus aureus, and one yielded a growth of diphtheroid bacilli only. The remaining case (No. 17) gave a pure growth of diplobacillus liquefaciens (Petit), which showed slight penicillin sensitivity and disappeared from the eye after treatment for two days.

g. Cultures from the staphylococcal cases became negative after treatment for one and two days respectively.

h. No bacteriological relapse occurred in the cases of this group.

Group 4.—The clinical and bacteriological features of the cases of this group are shown in Table VI.

SUMMARY.

a. No case was encountered due to a penicillin-resistant organism.

b. The blepharitis had been present for some years in each case and all the usual lines of treatment had been extensively employed.

c. In six cases there was marked improvement at the end of two weeks (Nos. 20, 21, 22, 23, 24 and 25). Ulcers were healed and discharge was eliminated but in each some erythema of the lid margins remained.

d. In two cases (Nos. 26 and 27) the response was less satisfactory, and in one case (No. 28) the result during therapy was disappointing, though improvement was noted during the period of observation.

e. One case (No. 25) had an infection of the skin of the right eyebrow and responded well; another (No. 27) with seborrhoea of the scalp and back showed a disappointing result.

f. No clinical relapse occurred during the period of observation.

g. Six of the cases were infections with coagulase-positive staphylococcus aureus, one with the Morax-Axenfeld bacillus and one with streptococcus viridans. The Morax-Axenfeld bacillus showed slight but definite penicillin-sensitivity in culture, and the other organisms were highly sensitive.

In Case 25 no growth was obtained at any time.

h. In four of the cases cultures became sterile after treatment for one day, in three cases after two days, and in one case (the Morax-Axenfeld infection) after three days.

i. Cases 24 and 28 showed bacteriological relapses—the former unaccompanied by clinical relapse. The organisms concerned in the relapses remained penicillin-sensitive.

Conclusions

As a local therapeutic measure for superficial infections of the conjunctiva, cornea, and lid margins, penicillin far excels any therapeutic agent we have hitherto employed. It would seem,

moreover, highly effective in stubborn cases which have proved resistant to the usual methods of treatment.

From the bacteriological viewpoint, penicillin, as employed in this investigation, eradicates sensitive organisms from the conjunctiva in a few days. It cannot, however, prevent reinfection after the cessation of treatment, and we saw no reason to believe that effective therapy with penicillin established any immunity to recurrent infection. In this connection, it is noteworthy that in the cases of this series which showed bacteriological relapse, the organisms causing the relapse were as sensitive to penicillin as were those causing the original infection.

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REFERENCES

1. ABRAHAM, E. P., CHAIN, E., FLETCHER, C. M., FLOREY, H. W., GARDNER, A. D., HEATLEY, N. G. and JENNINGS, M. A.—*Lancet* 2, p. 177. 1941.
2. FLEMING, A.—*Lancet* 2, p. 434, 1943.
3. FLOREY, M. E. and FLOREY, H. W.—*Lancet* 1, p. 387, 1943.
4. HARPER, G. J.—*Lancet* 2, p. 569, 1943.

THE INCIDENCE OF EYE DISEASE IN THE AUSTRALIAN IMPERIAL FORCES, MIDDLE EAST*

BY

Major J. BRUCE HAMILTON, A.A.M.C.

IN the *Australian Medical Journal* of January 10, 1942, I published for future medical historians a survey of 6,458 private patients seen in Tasmania between 1931-1939, with 14,317 diseased conditions under 239 disease headings. This gave a ratio of 2·22 diseases per patient. At the conclusion I promised a similar table of eye disease in the Australian Imperial Forces, and now I have pleasure in submitting it. This A.I.F. survey deals with 3,638 patients seen during 1941-1942, with 5,650 diseased conditions under 226 disease headings. This gives a ratio of 1·55 diseases

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per patient. For simplicity I have arranged the figures and percentages of civil and war eye disease side by side in the five tables presented, and for convenience have grouped certain diseases together in four tables. Table No. I is a general survey; in Table II are found the eye injuries; in Table III the visual disorders; in Table IV the muscular abnormalities; and in Table V the keratitis cases. These seemed to be the four groups worthy of special comparative study.

Tables are unsatisfactory reading at all times, so I feel that some generalised comments will be more stimulating. Can it be possible that in war there is less eye disease than in civil life? Definitely it appears so from those figures quoted in paragraph one. Certainly there are less eye injuries, despite the fact that these figures contain casualties from three active campaigns of the A.I.F. Table II shows the civil eye injuries as 15·6 per cent. and the army injuries as 9·4 per cent. On the medical side iritis, keratitis, choroiditis, and retinitis are also lower.

Mentioning iritis makes me emphasise the fact that despite the high incidence of gonorrhoea and dysentery in the Middle East, there is not one case of iritis in these figures from either disease. Interstitial keratitis showed a 0·16 per cent. incidence, while gonococcal ophthalmia has not occurred. It only stresses the fact that disease treatment in the A.A.M.C. is of the very highest order and complications at the very lowest ebb.

The loss of an eye is even lower in military than in civil practice, and so apparently is traumatic iris prolapse and traumatic cataract (see Table II). Vitreous haemorrhage is higher, but this is due to blast effect in battle, and is analogous to an ear-drum perforated by blast. But why the retinal detachment figures are so ridiculously low with so many other manifestations of blast in the body I am unable to determine.

Sympathetic ophthalmia has not been seen by me in military practice, despite the fact that I have had no facilities for slit-lamp microscopy.

The visual disorders, Table III, show a very high proportion of refractive errors, and disclose a number of visually B class men who have slipped through the rushed recruiting in Australia. It still further stresses the necessity of recruits with less than 6/9 vision in either eye being submitted to an ophthalmic examination before acceptance for overseas service.

The muscle anomalies (Table IV) were heavy, and many needed treatment. The result of these treatments will be recorded in a special report by me on this subject entitled "orthoptics in the field." Of more than passing significance were 17 cases of overaction of the inferior oblique, which cases I feel must be analysed at a later date.

The virus keratitis cases were very troublesome, and on the whole had a higher incidence than in Australia. I have written notes on these specific conditions in the Middle East, and they are to be published at a later date under the title "notes on forms of keratitis presumably due to the virus of herpes simplex." Suffice here to say that any pyrexia (malaria, relapsing fever, dysentery, or even T.A.B. injections) precipitate an attack of virus keratitis in one or both eyes, and that in the hot climate of the Middle East a virus corneal infection is difficult to eradicate (see Table V).

Glare asthenopia at 4·153 per cent. of cases and illumination deficiencies of 0·700 per cent. call for special comment, for none is recorded in my Tasmanian figures. The extremes of illumination manifest in the Middle East are responsible for the high eye consultation rate in the A.I.F. From desert glare when driving by day to black-out driving by night or to hurricane lamp for reading produces a contrast intolerable to many eyes. I have strongly advocated goggles for driving and petrol lamps for reading, and I must thank the Australian Red Cross for their continued help in the matter of goggles for the troops.

Pterygia showed a high incidence in the A.I.F., but then this disease is very prevalent both in tropical Australia and tropical Levant, while in Tasmania it is of little account. Nevertheless, in the Middle East very few pterygia required operative treatment, and when they were marsupialised the operation field remained irritable for months.

The amblyopias need to be mentioned. There are as many amblyopias ex anopsia, in army personnel as in civil life, 3·696 per cent. to 3·778 per cent. respectively, which again stresses too rapid recruiting. The functional amblyopias, on the other hand, are four times as common, which is only to be expected. The discrepancy between army and civil figures in congenital amblyopia I cannot explain.

I pointed out in my article of January 10, 1942, that hypopyon ulcer or hypopyon iritis was very rare in Tasmania, namely, 0·17 per cent. But in the army it is almost unknown at 0·084 per cent. This low military figure is possibly due to the early exhibition of sulphanilamide or its derivatives by mouth—for none of my patients had local application of these substances, as they were not procurable.

Iridocyclitis is extremely rare in the army, and four out of five of the cases were due to spirochaetal relapsing fever, detailed in "The ocular complication of relapsing fever," in course of publication. These four cases all recovered normal vision spontaneously and were not influenced by arsenic.

Anisocoria of non-Argyll Robertson and non-myotonic type is twice as prevalent in the army as in civil life. This is not due

to syphilis, as I have proved by many Kline tests, but is due to a high incidence of sandfly fever and anxiety state. Although these two diseases are aetiologically poles apart, they nevertheless seem to precipitate a similar type of anisocoria—that is, one which is transient and not permanent, and does not affect pupillary reactions to light and convergence.

Tropical or Egyptian ophthalmia was not once found in the whole series. This is astounding when it is realised that this was the major factor in bringing ruin to Napoleon's Egyptian campaign in 1800 A.D., and was the cause of some anxiety in the 1914-1918 campaign in the Middle East. Trachoma likewise was not contracted in one instance in the Middle East in my 3,638 patients, the whole of the 16 army cases having had their original infection in Australia prior to enlistment. Certainly hygiene was far better in 1941-1942 than in 1800, but with many military camps in 1941-1942 in close contact to Arab villages, in a country where trachoma and ophthalmia are rife, it makes one wonder how immunity to these dangers has changed so rapidly in 140 years.

Finally, those patients without any disease to account for symptoms. These figures (like functional amblyopia) were three times as high in the A.I.F. as they were in civil practice, but to find only 200 unnecessary consultations out of 3,638 soldiers reflects the greatest credit on the sagacity of the Unit R.M.Os. It is appropriate to remark here on the close co-operation prevailing in all branches of the A.A.M.C. and on the excellent consultation service always available to the men of the A.I.F.

In conclusion, I should like to thank the ophthalmic staff of an Australian General Hospital for their help with these figures, which have had my personal supervision throughout. Colonel J. G. Hayden, who commands this hospital, has given his permission for these figures to be published, for which I thank him also.

References

Except for my article on "Eye Disease in Tasmania," published in the *Medical Journal of Australia on* January 10, 1942, there is no available literature at my disposal on this subject. My articles on "The ocular complication of relapsing fever," "notes on forms of keratitis presumable due to the virus of herpes simplex," and "orthoptics in the field" are in the process of publication either in the *British Journal of Ophthalmology* or in the *Medical Journal of Australia*.

TABLE I

COMPARATIVE TABLES OF EYE DISEASES, ETC.

1. Private Practice, Hobart 1931–1939. 6458 patients, showing 14,317 diseased conditions, 239 diseases.

2. 7th A.G.H., Middle East, May 1941–November 1942. 3638 Australian patients, 5650 diseased conditions, 226 diseases.

List of Diseases, etc.	Civil	Per cent.	War	Per cent.
Abscess of brow	18	0·279	—	—
Abscess of caruncle	—	—	1	0·027
Accommodation, paralysis of	37	0·573	10	0·275
Albinism	5	0·077	—	—
Alopecia of eyebrow	—	—	1	0·027
Amblyopia, congential	35	0·542	5	0·137
Amblyopia ex anopsia	244	3·778	132	3·628
Amblyopia, functional	14	0·217	32	0·879
Anaesthesia of cornea	3	0·046	1	0·027
Anaesthesia of orbital nerves	3	0·046	3	0·082
Angioid streaks	4	0·062	—	—
Angioma	5	0·077	6	0·165
Angioneurotic oedema	2	0·031	1	0·027
Anisocoria	91	1·409	92	2·529
Anisometropia	82	1·270	38	1·045
Anophthalmos	83	1·285	24	0·660
Anopia, quadrantic and hemi.	16	0·248	4	0·110
Aphakia	153	2·369	6	0·165
Argyll Robertson pupil	5	0·077	2	0·054
Argyrosis	10	0·155	—	—
Atropine irritation	12	0·186	4	0·110
Birth Injuries	34	0·526	1	0·027
Blepharitis, simple	153	2·369	112	3·079
Blepharitis, ulcerative	7	0·108	6	0·165
Blepharospasm, functional	—	—	1	0·027
Burn of conjunctiva	10	0·155	8	0·220
Burn of cornea	12	0·186	4	0·110
Burn of lid	—	—	3	0·082
Burn of retina	—	—	2	0·055
Canaliculus, laceration of	3	0·046	3	0·082
Cataract, anterior polar	4	0·062	3	0·082
Cataract, blue dot	11	0·170	2	0·055
Cataract, complicated	50	0·774	5	0·137
Cataract, congenital	64	0·991	8	0·220
Cataract, diabetic	38	0·588	—	—
Cataract, glassblowers'	1	0·015	—	—
Cataract, lamellar	5	0·077	2	0·055
Cataract, senile	669	10·359	6	0·165
Cataract, traumatic	54	0·836	28	0·770
Cataract, X-ray	1	0·015	—	—
Chalazion	112	1·734	68	1·869
Choroid, atrophy (post traumatic)	—	—	2	0·055
Choroid, detachment of	1	0·015	—	—
Choroid, rupture of	5	0·077	3	0·082
Choroid, sarcoma of	11	0·170	1	0·027
Choroid, stretching of	39	0·604	—	—
Choroiditis, acute	9	0·139	2	0·055
Choroiditis, Tay's	63	0·975	14	0·385
Choroido-retinitis	168	2·601	90	2·474
Coloboma of retina	—	—	1	0·027
Colobomata of choroid	4	0·062	—	—

TABLE I—*continued*

List of Diseases, etc.	Civil	Per cent.	War	Per cent.
Colobomata of disc	3	0·046	—	—
Colobomata of iris	1	0·015	2	0·055
Colobomata of lid	5	0·077	2	0·055
Colobomata of macula	1	0·015	—	—
Colour blind	12	0·186	5	0·137
Conjunctival abrasion	5	0·077	1	0·027
Conjunctival cyst	10	0·155	2	0·055
Conjunctival foreign bodies	39	0·604	14	0·385
Conjunctival keloid	—	—	1	0·027
Conjunctival laceration	14	0·217	5	0·137
Conjunctivitis, acute, allergic ...	7	0·108	5	0·137
Conjunctivitis, acute, bac. unknown ...	89	1·378	108	2·968
Conjunctivitis, acute Koch-Weeks' ...	9	0·139	—	—
Conjunctivitis, acute, ophth. neona. ...	15	0·232	—	—
Conjunctivitis, acute, pneumococcal ...	8	0·124	—	—
Conjunctivitis, acute staph. and strep.	7	0·108	1	0·027
Conjunctivitis, angular	39	0·604	8	0·220
Conjunctivitis, chronic	243	3·763	198	5·443
Convergence excess	93	1·440	14	0·385
Convergence insufficiency	185	2·555	178	4·893
Corectopia	—	—	1	0·027
Corneal abrasion	81	1·254	12	0·330
Corneal abrasion recurrent	5	0·777	—	—
Corneal calcareous degeneration ...	4	0·062	—	—
Corneal erosions multiple	16	0·248	17	0·467
Corneal foreign bodies	104	1·610	70	1·924
Corneal laceration	12	0·186	3	0·082
Corneal nebulae	244	3·778	65	1·787
Corneal staphyloma	2	0·031	—	—
Corneal ulcer	138	2·137	28	0·770
Cyclitis	14	0·217	7	0·192
Cyclitis, sympathetic	2	0·031	—	—
Cyclophoria	12	0·186	4	0·110
Dacryoadenitis	—	—	2	0·055
Dacryocystitis, acute	18	0·279	1	0·027
Dacryocystitis, chronic	79	1·223	7	0·192
Dendritic ulcer	14	0·217	15	0·412
Dermoid of brow	1	0·015	—	—
Dermoid of lid	1	0·015	2	0·055
Dermoid of limbus	1	0·015	—	—
Dermoid of orbit	1	0·015	—	—
Diplopia, functional	—	—	1	0·027
Disseminated sclerosis	1	0·015	1	0·027
Divergence excess	13	0·201	1	0·027
Divergence insufficiency	108	1·672	81	2·226
Drusen	—	—	2	0·055
Eales' Disease	3	0·046	1	0·027
Ectropion	41	0·635	2	0·055
Electric ophthalmia	2	0·031	—	—
Embolism of central artery	3	0·046	1	0·027
Endophthalmitis	3	0·045	—	—
Enophthalmos	4	0·062	—	—
Entropion	7	0·108	1	0·027
Epicanthus	11	0·170	—	—
Episcleritis	10	0·155	2	0·055
Eserine irritation	9	0·139	1	0·027
Esophoria	199	3·081	177	4·865
Esotropia	185	2·555	46	1·264
Exophoria	425	6·581	125	3·433
Exophthalmos	26	0·403	7	0·192

TABLE I—*continued*

List of Diseases, etc.	Civil	Per cent.	War	Per cent.
Exotropia	89	1·378	29	0·797
Furuncle of caruncle	—	—	2	0·055
Glare asthenopia	—	—	151	4·151
Glaucoma, acute	8	0·124	1	0·027
Glaucoma, chronic	78	1·208	2	0·055
Glaucoma, secondary	50	0·774	3	0·082
Glioma retinae	2	0·031	—	—
Globe, contusion of	38	0·588	5	0·137
Globe, perforation of	64	0·991	11	0·302
Haemangioma	9	0·124	1	0·027
Haemorrhage, retinal	39	0·604	—	—
Haemorrhage, subconjunctival	62	0·960	20	0·550
Haemorrhage, subhyaloid	3	0·046	1	0·027
Herpes ophthalmicus	18	0·279	—	—
Heterochromia	9	0·139	2	0·055
Hordeolum	180	2·478	123	3·353
Horner's syndrome	4	0·062	2	0·055
Hyaloid, persistent	7	0·108	5	0·137
Hypermetropia	260	5·543	234	6·432
Hypermetropic astigmatism	1949	30·149	1044	28·697
Hyperphoria	107	1·657	23	0·632
Hyphaema	28	0·434	15	0·412
Hypopyon	11	0·170	3	0·082
Hypothyroidism	3	0·046	—	—
Icteroid conjunctiva	—	—	3	0·082
Illumination deficiency	—	—	25	0·687
Intracranial tumour	17	0·263	1	0·027
Intraocular foreign bodies	10	0·155	17	0·467
Iris, atrophy of	5	0·077	—	—
Iris, bombé	11	0·170	—	—
Iris, prolapse of	12	0·186	5	0·137
Iris, perforation of	5	0·077	—	—
Iris, sphincter rupture	6	0·093	3	0·082
Iridocyclitis	55	0·851	5	0·137
Iridodialysis	9	0·139	1	0·027
Iritis, acute	44	0·681	7	0·192
Iritis, diabetic	5	0·077	—	—
Iritis, old	26	0·403	5	0·137
Jaw blinking	—	—	1	0·027
Keratitis (unspecified)	16	0·243	9	0·247
Keratitis acne rosacea	11	0·170	—	—
Keratitis bullous	4	0·062	—	—
Keratitis disciform	3	0·046	5	0·137
Keratitis filamentary	3	0·046	—	—
Keratitis herpetic	—	—	3	0·082
Keratitis interstitial	29	0·449	6	0·165
Keratitis lagophthalmos	5	0·077	2	0·055
Keratitis marginal	60	0·929	47	1·292
Keratitis mustard gas	2	0·031	—	—
Keratitis neuroparalytic	9	0·139	—	—
Keratitis profunda	12	0·186	1	0·027
Keratitis, striate	8	0·124	1	0·027
Keratitis, superficial	15	0·232	2	0·055
Keratitis, superficial punctate	95	1·471	37	1·017
Keratitis, vesicular	11	0·170	9	0·247
Keratoconus	32	0·495	2	0·055
Keratoglobus	—	—	1	0·027
Lacrimal fistula	3	0·046	1	0·027
Lashes, itinerant	8	0·124	—	—
Lens, dislocation of	15	0·232	3	0·082

TABLE I—*continued*

List of Diseases, etc.	Civil	Per cent.	War	Per cent.
Leucoma	13	0·201	5	0·137
Lid, abrasion	4	0·062	—	—
Lid, abscess	—	—	2	0·055
Lid, concretions	30	0·464	20	0·550
Lid, contusion	16	0·248	8	0·220
Lid, dermatitis	20	0·310	11	0·302
Lid, fibromata	—	—	1	0·027
Lid, foreign bodies	6	0·093	5	0·137
Lid, herpes	4	0·062	6	0·165
Lid, laceration	11	0·170	26	0·715
Lid, papilloma	27	0·418	2	0·055
Lid, retention cyst	19	0·294	—	—
Lid, retraction	18	0·279	2	0·055
Lid, sebaceous cyst	—	—	4	0·110
Lid, tropical ulcer	—	—	1	0·027
Lid, warts of	11	0·170	1	0·027
Lupus Vulgaris	1	0·015	—	—
Macula, hole at	5	0·077	2	0·055
Macula, massive haemorrhage	2	0·031	—	—
Macula, senile pigmentary degeneration	104	1·610	7	0·192
Magalocornea	10	0·155	2	0·055
Melanoma of caruncle	—	—	3	0·082
Melanoma of iris	7	0·108	—	—
Melanoma of retina	25	0·387	5	0·137
Mickulicz's disease	1	0·015	—	—
Microcornea	5	0·077	4	0·110
Microphthalmia	5	0·077	2	0·055
Migraine	38	0·588	10	0·275
Miosis	4	0·062	4	0·110
Mixed astigmatism	654	10·127	301	8·274
Mydriasis	20	0·310	11	0·302
Myiasis, ocular	—	—	1	0·027
Myopia	96	1·487	30	0·820
Myopic astigmatism	1043	16·150	406	11·160
Myotonic pupil	7	0·108	—	—
Myxoedema	3	0·046	—	—
Naevus, pigmented	23	0·356	4	0·110
Nasal accessory sinus infection	24	0·371	3	0·082
Nothing abnormal diagnosed	115	1·781	200	5·500
Nystagmus	60	0·929	6	0·165
Night blindness	—	—	4	0·110
Obstruction, naso-lacrimal duct	55	0·851	3	0·082
Obstruction, punctum canaliculus	37	0·573	3	0·082
Occlusion of posterior cerebral artery	11	0·170	—	—
Oedema of lid, insect bite	2	0·031	—	—
Odema of lid, thyrotoxicosis	1	0·015	4	0·110
Opaque nerve fibres	13	0·201	5	0·137
Ophthalmia, snow	—	—	1	0·027
Ophthalmia, sympathetic	2	0·031	—	—
Optic atrophy, Leber's	6	0·093	1	0·027
Optic atrophy, primary	30	0·464	3	0·082
Optic atrophy, secondary	13	0·201	4	0·110
Optic disc, cyst of	2	0·031	1	0·027
Optic nerve, contusion of	—	—	2	0·055
Orbital cellulitis	2	0·031	—	—
Orbital foreign bodies	2	0·031	10	0·275
Oval pupils	—	—	6	0·165
Overaction of inferior oblique	4	0·062	17	0·467
Overaction of superior oblique	—	—	1	0·027
Panophthalmitis	3	0·046	1	0·027

TABLE I—*continued*

List of Diseases, etc.	Civil	Per cent.	War	Per cent.
Papillitis	23	0·356	4	0·110
Papilloedema	9	0·139	2	0·055
Paralysis, external rectus	22	0·341	1	0·027
Paralysis, facial or orbicularis	21	0·325	9	0·247
Paralysis, inferior oblique	1	0·015	2	0·055
Paralysis, inferior rectus	1	0·015	1	0·027
Paralysis, internal rectus	4	0·062	1	0·027
Paralysis, superior oblique	2	0·031	3	0·082
Paralysis, superior rectus	14	0·217	3	0·082
Paralysis, 3rd nerve	12	0·186	1	0·027
Paralysis, 3rd and 4th nerves	1	0·015	—	—
Paralysis, 3rd and 6th nerves	5	0·077	—	—
Paralysis, 5th nerve	—	—	1	0·027
Paralysis, 6th nerve	13	0·201	3	0·082
Pemphigus	—	—	2	0·055
Perivasculitis	2	0·031	—	—
Phlycten	42	0·650	—	—
Phthisis bulbi	10	0·155	1	0·027
Pinguecula	14	0·217	12	0·330
Pituitary neoplasm	1	0·015	—	—
Post cortical contusion	—	—	1	0·027
Presbyopia	1978	30·598	276	7·587
Pseudo-neuritis	14	0·217	4	0·110
Pterygium	97	1·502	163	4·480
Ptosis	37	0·573	7	0·192
Pupillary membrane, persistent	7	0·108	—	—
Retinae commotio	8	0·124	5	0·137
Retinal arteriosclerosis	169	2·308	10	0·275
Retinal detachment	60	0·929	7	0·192
Retinal haemorrhage	39	0·604	14	0·385
Retinitis, active	30	0·464	10	0·275
Retinitis, albuminuric	9	0·139	1	0·027
Retinitis, arteriosclerotic	35	0·542	5	0·137
Retinitis, circinata	2	0·031	—	—
Retinitis, diabetic	27	0·418	—	—
Retinitis, pigmentosa	13	0·201	2	0·055
Retinitis, proliferans	14	0·217	4	0·110
Retinitis, sen. mass. exud.	10	0·155	—	—
Retrobular neuritis	10	0·155	2	0·055
Sclera, foreign body of	—	—	3	0·082
Sclera, rupture of	1	0·015	2	0·055
Scleritis	18	0·279	4	0·110
Siderosis bulbi	4	0·062	—	—
Socket contraction	2	0·031	—	—
Stenosis, puncta and canaliculus	6	0·093	—	—
Supra-orbital neuralgia	—	—	7	0·192
Symblepharon	5	0·077	1	0·027
Synchisis scintillans	13	0·201	—	—
Synechiae, anterior	31	0·480	2	0·055
Syphilis	37	0·573	2	0·055
Thrombosis, retinal vein	32	0·495	—	—
Thyrotoxicosis	22	0·341	—	—
Trachoma	12	0·186	16	0·440
Trichiasis	46	0·712	8	0·220
Ulcer, rodent	7	0·108	2	0·055
Uveitis	9	0·139	2	0·055
Vitreous detachment	—	—	2	0·055
Vitreous haemorrhage	30	0·464	18	0·495
Vitreous opacities	160	2·477	13	0·357
Vitreous prolapse	2	0·031	—	—
Xanthelasma	4	0·062	—	—

TABLE II

COMPARATIVE LIST OF EYE INJURIES (*see Table I*)

Injuries	Civil	Per cent.	War	Per cent.
Anophthalmos	83	1·285	24	0·660
Aphakia	153	2·369	6	0·165
Burn of conjunctiva	10	0·155	8	0·220
Burn of cornea	12	0·186	4	0·110
Burn of lid	—	—	3	0·082
Canaliculus, laceration of	3	0·046	3	0·082
Cataract, traumatic	54	0·836	28	0·770
Choroid, atrophy of (post traumatic)	—	—	2	0·055
Choroid, rupture of	5	0·077	3	0·082
Conjunctival abrasion	5	0·077	1	0·027
Conjunctival foreign bodies	39	0·604	14	0·385
Conjunctival laceration	14	0·217	5	0·137
Corneal abrasion	81	1·254	12	0·330
Corneal foreign bodies	104	1·610	70	1·924
Corneal laceration	12	0·186	3	0·082
Globe, contusion of	38	0·588	5	0·137
Globe, perforation of	64	0·991	11	0·302
Hyphaema	28	0·434	15	0·412
Hypopyon	11	0·170	3	0·082
Intraocular foreign bodies	10	0·155	17	0·467
Iris, prolapse of	12	0·186	5	0·137
Iris, perforation of	5	0·077	—	—
Iris, sphincter rupture of	6	0·093	3	0·082
Iridodialysis	9	0·139	1	0·027
Lens, dislocation of	15	0·232	3	0·082
Lid, abrasion	4	0·062	—	—
Lid, contusion	16	0·248	8	0·220
Lid, foreign bodies	6	0·093	5	0·137
Lid, laceration	11	0·170	26	0·715
Optic atrophy, primary	30	0·464	3	0·082
Optic nerve, contusion of	—	—	2	0·055
Orbital foreign bodies	2	0·031	10	0·275
Panophthalmitis	3	0·046	1	0·027
Phthisis bulbi	10	0·155	1	0·027
Retinae commotio	10	0·124	5	0·137
Retinal detachment	60	0·929	7	0·192
Retinitis, proliferans	14	0·217	4	0·110
Siderosis bulbi	4	0·062	—	—
Symblepharon	5	0·077	1	0·027
Synechiae, anterior	31	0·480	2	0·055
Vitreous haemorrhage	30	0·464	18	0·495
Vitreous prolapse	2	0·031	—	—
39 headings (Civil)	1009	15·624		
38 headings (War)			342	9·400

TABLE III

COMPARATIVE LIST OF VISUAL DISORDERS (*see Table I*)

Visual Disorder	Civil	Per cent.	War	Per cent.
Anisometropia	82	1·270	38	1·045
Hypermetropia	260	5·543	234	6·432
Hypermetropic astigmatism	1949	30·149	1044	28·697
Mixed astigmatism	654	10·127	301	8·274
Myopia	96	1·487	30	0·824
Myopic Astigmatism	1043	16·150	406	11·160
Presbyopia	1978	30·598	276	7·587
7 Headings	6062	95·324	2329	64·019

TABLE IV

COMPARATIVE LIST OF MUSCULAR ANOMALIES

(see Table I)

Condition	Civil	Per cent.	War	Per cent.
Accommodation, paralysis of	37	0·573	10	0·275
Convergence excess	93	1·440	14	0·385
Convergence insufficiency	185	2·555	178	4·893
Cyclophoria	12	0·186	4	0·110
Diplopia, functional	—	—	1	0·027
Divergence excess	13	0·201	1	0·027
Divergence insufficiency	108	1·672	81	2·226
Esophoria	199	3·081	177	4·865
Esotropia	185	2·555	46	1·264
Exophoria	425	6·581	125	3·436
Exotropia	89	1·378	29	0·797
Hyperphoria	107	1·657	23	0·632
Overaction of inferior oblique	4	0·062	17	0·467
Overaction of superior oblique	—	—	1	0·027
Paralysis, external rectus	22	0·341	1	0·027
Paralysis, facial or orbicularis	21	0·325	9	0·247
Paralysis, inferior oblique	1	0 015	2	0 055
Paralysis, inferior rectus	1	0·015	1	0·027
Paralysis, internal rectus	4	0·062	1	0·027
Paralysis, superior oblique	2	0·031	3	0·082
Paralysis, superior rectus	14	0·217	3	0·082
Paralysis, 3rd nerve	12	0·186	1	0·027
Paralysis, 3rd and 4th nerves	1	0·015	—	—
Paralysis, 3rd and 6th nerves	5	0·077	—	—
Paralysis, 5th nerve	—	—	1	0·027
Paralysis, 6th nerve	13	0·021	3	0·082
Ptosis	37	0·573	7	0·192
24 headings (Civil)	1590	24·000		
25 headings (War)			739	20·313

TABLE V

COMPARATIVE LIST OF KERATITIS (*see Table I*)

Keratitis	Civil	Per cent.	War	Per cent.
Corneal erosions—multiple	16	0·248	17	0·467
Dendritic ulcer	14	0·217	15	0·412
Keratitis (unspecified)	15	0·232	9	0·247
Keratitis, acne rosacea	11	0·170	—	—
Keratitis, bullous	4	0·062	—	—
Keratitis, disciform	3	0·046	5	0·137
Keratitis, filamentary	3	0·046	—	—
Keratitis, interstitial	29	0·449	6	0·165
Keratitis, lagophthalmos	5	0·077	2	0·055
Keratitis, lattice	1	0·015	1	0·027
Keratitis, marginal	60	0·929	47	1·292
Keratitis, mustard gas	2	0·031	—	—
Keratitis, neuroparalytic	9	0·139	—	—
Keratitis, profunda	12	0·186	1	0·027
Keratitis, striate	8	0·124	1	0·027
Keratitis, superficial	15	0·232	2	0·055
Keratitis, superficial punctate	95	1·471	37	1·017
Keratitis, vesicular	11	0·170	9	0·247
18 headings (Civil)	313	4·844		
13 headings (War)			152	4·180

OCULAR NEUROSIS*

BY

Squadron Leaders A. M. G. CAMPBELL,

and

A. G. CROSS, R.A.F.

OCULAR symptoms may exist in the absence of any organic lesion of the eyes, or may appear to be of a severity which is disproportionate to the pathological abnormality. Cases showing these symptoms are neurotic in type and are particularly numerous in wartime. Hysterical amblyopia is a well recognised syndrome, and was described by Hurst (1942) in the 1914-1918 war in soldiers who had been exposed to acute battle stress. He summarised the condition by stating that "In order to see it is necessary to look, and if the hysteric does not wish to look, he will not see." Mahoney and Linhart (1943) have described field changes in cases of hysterical amblyopia occurring amongst American soldiers during this war. All their cases showed psychological inferiority before joining the army. Werner Bab (1942) has discussed the "Psychologic" problem in ophthalmological diagnosis, and Michaelson (1943) has published an account of the ocular manifestations of neurosis among troops in the Middle East war zone. Cameron and Stephenson (1943), in a paper describing anxiety states in the Navy, mention that minor ocular neuroses were relatively common. We desire to emphasise that these conditions occur frequently among members of the armed forces serving in the British Isles. The incidence is difficult to assess with accuracy, but we believe, after examination of 500 consecutive cases attending a Service ophthalmic clinic in wartime, that thirty-four per cent. (34 per cent.) are psychogenic rather than organic in type. No figures are available of the percentage in a peace-time hospital ophthalmic clinic or in a civilian centre in time of war, but Bruce-Pearson (1938) estimated that fifteen to sixteen per cent. (15-16 per cent.) attending a medical out-patient department in peace-time had no organic basis for their symptoms, and Todd (1943) found that among five hundred (500) consecutive cases attending the medical out-patient department of a Service hospital twenty-nine per cent. (29 per cent.) had a psychoneurosis.

Aetiology

Psychiatric background.—A history of previous nervous breakdown in the patient or his family is often present, and childhood traits of neurotic origin may be reported. Unhappiness in the

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home in childhood and parental strife may also form a background. The importance of predisposition has been stressed by Curran and Mallinson (1940), Gillespie (1942), and Symonds (1943) in papers dealing with the neuroses of war.

CASE 1.—A.B., aged 26 years, complained of diplopia when landing his aircraft, for which no organic cause could be found. On examination he was found to be physically fit, but his psychiatric background proved to be most unstable, and his personality was hysterical. He had tried many civilian occupations, and had joined the Service in a fit of bravado. The diplopia was cured by psycho-therapy and he resumed flying duties, but had only achieved a further fifteen (15) hours when he had to bale out, and suffered a fractured ankle, which subsequently induced a hysterical limp.

CASE 2.—C.D., aged 22 years, presented himself complaining of photophobia. He said that he was dazzled when his machine was caught in searchlights over Berlin, and that since that time he had not been able to face bright lights. Investigation of his history revealed that he had always been a nervous and anxious child, with nightmares to a late age. He had an abnormal fear of water and had never learned to swim. The most significant fact in his history was that, after being accused of stealing some money in civilian life, he had an amnesia until after the accusation was proved false. This man, despite his predisposition, had performed 270 hours operational flying in Bomber Command before developing hysterical photophobia.

Environment.—The occupation, climate, and contentment of the patient in his or her surroundings are important factors. Many members of the Services must work at uncongenial tasks under conditions of discomfort. Those who work in underground rooms commonly complain of ocular strain, and in one group of about a hundred, ten per cent. (10 per cent.) over a period of one year complained of ocular symptoms, which they attributed to bad lighting, though the illumination was very good. Their complaints which were based on a chronic anxiety and dislike of working underground, had no physical basis, and improved when ordinary electric light was replaced by artificial daylight, which encouraged a subconscious feeling that they were not below ground level. Climatic conditions are concerned in the development of ocular neurosis in men posted overseas. Men who believe that they have " weak eyes " often manifest ocular anxiety symptoms as a result of a conviction that the heat and glare of the tropics will have an adverse effect on their vision. Michaelson points out how this has caused the breakdown of certain individuals among troops on the voyage from Freetown to Capetown, while journeying to the Middle East zone. Anxiety neurosis has been seen in a pilot who, having heard of snow blindness, thought

that he would lose his sight after long reconnaissance flights in the Arctic regions. Exposure to wind and weather may lead to the development of neurotic symptoms. The ordinary discipline of Service life, with its confines and limitations, is irksome to many and plays a part in starting a neurosis.

Ocular awareness.—The eyes are among the most usual organs of the body to be involved in the manifestations of neuroses because everyone is sensible of their importance in the living of a normal life. The kidneys are more important, but, buried in the abdomen, they are seldom disturbed by functional symptoms. Werner Bab says, " The eye has to face, has to see, the whole of the hostility brought about by the struggle of, and for, daily life." In women there is the added factor of the importance of the eyes in feminine attraction. The basis of a neurotic reaction is produced by any factor which induces an abnormal awareness of the ocular mechanism. The fussy mother who tells her child that he must be careful not to strain his eyes may sow the seed of a future ocular neurosis, and people who have worn glasses at school may, in adult life, develop neurotic symptoms of ocular type in the absence of any organic abnormality. Ocular diseases which produce diminution of visual acuity may be accompanied by considerable functional overlay as a result of anxiety regarding the future course of the disease. It is found that a large proportion of patients, with heterophoria of significant degree, exhibit neurotic manifestations, doubtless a reaction to the continuous stress of endeavouring to maintain binocular vision. Gillespie (1944) has found sixty-two per cent. (62 per cent.) of sixty-one (61) cases of heterophoria in aircrew were nervously predisposed.

One group of patients which has a marked ocular awareness consists of people with a blind or almost sightless eye and a seeing eye, who suffer from anxiety associated with the thought of possible damage to that which is normal. Under Service conditions nearly a hundred per cent. (100 per cent.) of monocular personnel show neurotic symptoms.

CASE 3.—E.F., aged 36 years. The right eye was lost in childhood following an injury when his glasses were broken by a stone. The left vision was said to have been defective for one year. On examination the left vision was 6/60 −0·5cyl. axis 140 deg. 6/60. No organic change was present in the left eye. The visual field showed gross contraction. Investigation revealed an anxiety state induced by the absence of the right eye and fear of damage to the left eye.

Domestic stress.—Separation from home and family and the inability to deal adequately with domestic situations may cause anxiety symptoms.

CASE 4.—I.J., aged 50 years, a reservist, after four years' service in the R.A.F., began to complain of monocular diplopia.

No ocular lesion was found, his symptoms being hysterical and being due to worry about his wife's serious illness and the possible loss of his civilian employment to another man who had been, prior to the war, in a more junior position. His symptoms improved with re-assurance.

CASE 5.—K.L., aged 35 years, complained of diminished vision. Vision was 6/60 in each eye, with no gross refractive error. He had always shown nervous traits and had been over-attached to his mother, who had recently died. His vision had become progressively worse after this event.

Head injuries.—Hysteria and anxiety states are prone to occur after head injuries and functional amblyopia is found not infrequently. Organic damage of the globe and temporary or permanent paresis of ocular muscles may be the result of the accompanying injuries:

CASE 6.—M.N., aged 35 years, suffered a moderately severe concussion in an air raid. At the same time her husband and young son were killed. On recovering consciousness she was found to have a paresis of the lateral rectus muscle of the left eye and left visual acuity of 6/60. No improvement had taken place in six weeks and no organic cause could be found. G/Cpt. Keith Lyle, Senior Ophthalmic Specialist, R.A.F., was convinced that the condition was hysterical, connected with the severe emotional shock. This was confirmed when treatment by persuasion and re-assurance improved the vision to 6/18. This patient was co-operative and intelligent, and accepted readily the explanatory part of the treatment. She remembered after a period of psychotherapy that she had seen her husband collapse before she lost consciousness.

Flying.—This factor is somewhat specialised, but certain points may be mentioned. Flying and the strain which it may entail is an important factor in the production of ocular neurosis in all members of aircrew, who depend for their very existence on the continuing efficient use of their eyes under most trying conditions. A pilot who begins to lose confidence and judgment in landing or in formation flying is apt to blame his eyes and not his mental make-up. The incidence of neurosis, however, is not so great among flying personnel as compared with ground staff, because the former are a carefully selected group.

CASE 7.—O.P., aged 24 years, an experienced pilot, performed a series of bad landings, and it was thought that his lack of judgment was due to defective muscle balance. No organic abnormality was found, the true cause of the symptoms being a lack of confidence in the new type of aircraft he had been flying. He had made a bad landing on his initial flight in this aircraft.

Clinical Manifestations

Blindness and defective vision.—The failure of vision varies in degree from complete blindness in both eyes to a mild defect in one eye. In these functional cases a characteristic feature is that the patient's ability to read the lines of letters on the Snellen's chart does not vary directly according to his distance from the chart, as happens with simple cases of visual defect due to a refractive error. It is frequently found that a man who reads 6/24 at 6 metres professes to be unable to read any more at 3 metres. It is always noteworthy, also, that no matter what is the extent of the visual defect on examination, these people can always see sufficiently well to keep themselves from harm, as by walking in front of moving traffic. The field of vision is usually contracted and it may be irregular. It may be found to be larger when measured with a smaller test object, or a larger field may be present for colours than for white. The duration of the visual defect is variable. So-called " black-outs " are often described, in which the vision is lost completely for a few seconds with subsequent full memory. These may be vasomotor in origin and occur as a disturbance at the psychological level on the basis of an anxiety state; the neurotic black-out is usually a sudden preoccupation and lack of reality and not necessarily connected with a vasomotor disturbance.

CASE 8.—Q.R., aged 29 years. Blurring of vision described in one eye at 13.00 hours, progressing to complete bilateral blindness by 22.00 hours. Recovery commenced during the night and was complete 24 hours later. Subsequent investigation revealed that she was the only female officer at her station, and an hysterical state had been precipitated by imaginary difficulties arising in the course of her duties. Although this case was considered to be hysterical, the possibility of the symptoms being due to arterial spasm cannot be altogether ruled out if it is admitted this occurred in a hysterical individual. This symptom is also illustrated in Case 3.

Asthenopia.—Eye-ache, eye-strain and tiredness of the eyes are common complaints in neurotic patients. The pain is frequently exaggerated, and in some described as going through the eyes " like a red-hot needle," or feeling like " a red-hot coal " at the back of the eyes. Investigation frequently reveals that the discomfort is always present while working at Service duties, but that other close work can be done without difficulty, though in bad cases the patient protests that any kind of reading brings on pain. The symptoms rarely disturb sleep.

CASE 9.—Aged 26 years. Complained of headaches and eye-ache of three years' duration. They had started while on a flight mechanic training course. They were always worse in bright sunshine, and as his work was often in the open air he was not a

very useful member of the Service. There was no organic abnormality of the eyes except a very small degree of hypermetropia. Investigation proved that an anxiety state was present as a result of his dislike of his duties. He was re-mustered to another trade and his headaches ceased.

Photophobia and excessive blinking.—These symptoms are very common neurotic manifestations in the eyes, and may accompany other complaints of functional type. They vary in degree from a mild dislike of bright light to almost complete blepharospasm, which renders examination of the eye a matter of extreme difficulty. Cameron and Stephenson (1943) found this symptom after exposure to explosion flash in naval personnel. It is often found that photophobia is worse in artificial light than in daylight. In the ordinary neurotic patient complaining of these symptoms no abnormal conjunctival congestion is found.

CASE 2 demonstrates an example of this system.

Night blindness.—This is a common complaint under Service conditions, and though sometimes due to organic changes in the retina, high refractive errors, or increasing age, it is, in the majority of cases, neurotic in origin. Everyone has difficulty with night vision in the blackout, and it is only where a neurosis is present that the individual is unable to adapt himself to the difficulties involved. The onset is frequently relatively acute following a slight accident or a change to an occupation which is disliked.

CASE 10.—U.V., aged 32 years, complained of severe headache and inability to see at night, of two months' duration. The refractive error was small, and no other organic abnormality was present in the eyes. Investigation revealed that two months previously he had been transferred to work which necessitated his driving a car at night, and this had precipitated an anxiety state.

Diplopia.—This is a common complaint which often is not present when the patient comes to examination, no matter how frequently this is repeated. Thus it is not possible to attempt any assessment of the type of diplopia. When present at examination it is usually found to be due to a deficiency of convergence, which, as Bielschowsky and others have pointed out, is usually of functional origin. Treatment of this, in the presence of an underlying neurosis, is not satisfactory. In a few cases where diplopia was present at examination it was quite irregular and did not correspond to the paresis of any muscle. The diplopia may be uniocular; one case has shown triplopia.

CASE 11.—W.X., aged 49 years, complained of double vision of vertical and horizontal type of three months' duration. No history of strabismus. Examination revealed no organic change except a few peripheral lens opacities. Investigation of the diplopia showed that the two objects were in the same relationship

throughout the whole field, one being above and to the right of the other. Diplopia persisted when the left eye was covered but not when the right eye was covered. Psychiatric examination revealed an anxiety neurosis due to worry about his home and civilian occupation.

CASE 12.—Y.Z., aged 35 years. A severe head injury seven years ago, now complains of headache and triplopia. No organic ocular change except a small degree of hypermetropia. Examination of the triplopia showed that one object is central and that the objects on each side tend to be inclined away from the middle one. Investigation revealed an anxiety neurosis following his head injury.

It should be emphasised that cases of neurosis are essentially polysymptomatic and that two or more of the above symptoms usually occur in the same patient. It is also worthy of note that symptoms tend to be contradictory, and signs to be irregular, as compared with organic conditions.

Diagnosis

The most careful history must be taken and full examination made to exclude organic disorders of a magnitude capable of producing the symptoms of which complaint is made. This is important therapeutically, also, to instil confidence in the patient that full investigation is being carried out. Subsequently the psychiatric state may be probed for the aetiological factors previously outlined. No single clinical finding is characteristic of cases of this type, and the classical spiral field of hysteria has not been found in our series. Two organic cases which were at one period diagnosed as functional in type illustrate the necessity of full and careful examination.

CASE 13.—A.Z., aged 22 years, had for two years complained of increasing fatigue, of periods of diplopia, and for the last three months of dysphagia during her evening meal. This girl had been diagnosed as hysterical by three psychiatrists, one stating that she showed the typical " la belle indifference." This was the myasthenic facies, and the case was one of myasthenia gravis. She responded rapidly to prostigmine and is now leading an active life. The normal remissions connected with this disease had been thought to reinforce the diagnosis of hysteria.

CASE 14.—B.Y., aged 24 years, began complaining of increasing anxiety and severe right-sided headache. The symptoms were thought to be due to an anxiety neurosis, but after a month her right eye became slightly exophthalmic, although there was at this time no other signs of thyrotoxicosis. After another month had passed she showed a well-marked thyrotoxic reaction with bilateral exophthalmos, a resting pulse of from 90 to 100, and a

basal metabolic rate of plus fifty (+50). After eight weeks of medical treatment she had improved sufficiently to return to light work, and her basal metabolic rate was reduced to plus twenty (+20).

Treatment and Prognosis

The treatment of such cases depends on how much value reassurance of the patient will have in clearing up his symptoms, and will only be really effective in a patient whose basic personality is sound. At times it may be possible to help by settling some domestic or environmental stress. Fear of going overseas to a degree to induce neurosis is a contra-indication to foreign service.

The prognosis of cases where real fear of disease exists is good because careful examination and re-assurance often cures them. Where the conflict is deeper and is bound up with various fears and troubles intimately connected with Service life the prognosis for future service is poor, and in particular the hysterical cases, as seen in Case 1, will be all too prone to develop further somatic disturbances of hysterical origin, even if their ocular conditions respond to psychotherapy. A large number of these cases are capable of living a useful life under civilian conditions, and invaliding from the Service may cause a marked improvement in their symptoms.

Commentary

The cases described are seen primarily by the ophthalmologist, and it is desirable, if he is not a skilled psychiatrist, that they should be referred for psychological investigation of the underlying causes of the symptoms. Certain cases have been on the borderline of neurosis and conscious malingering, but these are few, and we consider malingering to be rare. It is desired to emphasise that among the different causes of ocular neurosis the common factor which appears in all is "ocular awareness." Werner Bab has divided the cases into those with organic disease and those without, but we postulate that all patients believe that they have an organic change in their eyes, and this is the precipitating factor which decides the localisation of the neurotic symptoms. All cases of chronic illness tend to develop a functional overlay, and chronic ocular conditions are no exception. The careless remarks of friends and relations may act as a spark which causes the development of a neurosis, while Stephenson and Cameron find a significant number of cases become ocularly conscious due to blindness in a relative and a corresponding fear of the patient. The incidence of such cases in war has not been, in the majority, due to battle stress, but a result of the varied maladjustments incurred by service. Most of our cases have been,

like those of Michaelson, chronic anxiety neuroses rather than hysterics, and where a gross hysterical defect has been found the patient has been constitutionally inferior and mentally backward.

It is advisable to diagnose and dispose of these cases as rapidly as possible, and a lengthy stay in hospital is undesirable, although careful examination to exclude organic disease is essential. Many of the cases of ocular neurosis are inevitable in wartime, and no remedy exists. A greater education of the public in ocular hygiene and eradication of the belief that working in artificial light and close study damage the eyes might reduce the incidence of ocular neurosis. It is suggested that an intelligent realisation of the strength and potentialities of the normal eye can do nothing but good.

Summary

1. A description is given of the aetiology, clinical manifestations, diagnosis, prognosis, and treatment of neurotic ocular conditions.

2. Emphasis is laid on the common factor of ocular awareness found in all cases.

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REFERENCES

HURST, A. P. (1943).—"Medical Diseases of the War." Arnold, London.

MAHONEY, V. P. and LINHART, W. O. (1943).—War Medicine, 1943, Vol. III, p. 303.

WERNER BAB (1937).—*Münch. Med. Wochr.*, Vol. XVI, p. 612.

——— (1942).—*Amer. Jl. Ophthal.*, Series 3, Vol. XXV, p. 321.

CAMERON, J. and STEPHENSON, C. V. (1943).—*Brit. Med. Jl.*, Vol. II, p. 603.

MICHAELSON, L. C. (1943).—*Brit. Med. Jl.*, Vol. II, p. 538.

BRUCE PEARSON, R. (1938).—*Lancet*, Vol. I, p. 451.

TODD, J. W. (1942).—*Brit. Med. Jl.*, Vol. I, p. 19.

CURRAN, D. and MALLINSON, W. P. (1940).—*Lancet*, Vol. II, p. 738.

GILLESPIE, R. D. (1942).—"Psychological Effects of War on Citizens and Soldiers." Chapman and Hall, London.

SYMONDS, C. P. (1943).—*Brit. Med. Jl.*, Vol. II, p. 703.

BIELSCHOWSKY, A. (1939).—*Amer. Jl. Ophthal.*, Vol. XXII, p. 603.

OPERATIONS ON ONE HUNDRED CASES OF CONVERGENT CONCOMITANT SQUINT*

BY

S. H. FAULKNER, Lieut. E. SCULLY *and*
Miss E. E. CARTER

MANCHESTER

THE following series of 100 consecutive cases operated on for convergent concomitant squint is recorded to show the degree of success which can be obtained by operation combined with orthoptic treatment. The patients were children from 6 to 14 years old, referred from the Salford Education Committee Clinic and operated on at the Salford Municipal Hospital. It is estimated that in the orthoptic clinic approximately 45 per cent. of concomitant squint cases are of the accommodative type and respond satisfactorily to treatment by glasses and orthoptics without operation. Of the rest, less than 1 per cent. suffer from conditions such as nystagmus, rendering them unsuitable for operation. This series is representative of the remainder, though some of the cases on the waiting list were operated on before their turn, owing to their having almost reached the school-leaving age, and one of the cases of inferior oblique overaction was given priority owing to its clinical interest.

Of the 100 cases, it was found that binocular vision at the angle of squint was obtained prior to operation in 45 cases. These cases are referred to as treatment cases. The remaining 55 cases are referred to as cosmetic cases. In 19 of these no attempt at occlusion or orthoptic treatment was made, as the children were either at evacuated schools, rendering repeated attendances impossible,

	Cosmetic Cases			*Treatment Cases*
Total Cases	No attempt at Orthoptic Treatment	Occlusion failed to improve vision	Vision satisfactory in each eye. No binocular vision	Satisfactory Binocular vision at angle of squint
100	19	22	14	45

or had almost reached the age for leaving school. In 22 cases occlusion failed to produce satisfactory vision in the amblyopic eye. In many of these, probably in most, occlusion was not

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satisfactorily carried out by the patient. The vision was considered satisfactory if there was not more than 1½ lines difference between the two eyes on the Snellen Type. Of the remaining 14 cases the vision in both eyes was satisfactory, but binocular vision at the angle of squint could not be established.

The operations were carried out under general anaesthaesia, and the following table shows the results obtained. The post-operative angle was measured without glasses being worn.

Cosmetic Cases	Eyes straight angle 0 to +5°	Angle +6° to +10°	Angle +11° to +25°	Over-correction
55	51	2	2	0
Treatment Cases				
45	41	3	2	0
Total Cases				
100	92	5	4	0

The operations carried out in the first place were advancement and recession 48, bilateral recession 32, bilateral advancement 6, single advancement 8, single recession 4, single recession combined with myectomy of inferior oblique 1, myectomy of inferior oblique 1.

In the group of 92 cases, straight after operation a second operation had been found necessary in six cases. In three of these the original angle was 35 deg., and it was found that a double operation did not usually correct the angle by more than 30 deg. A single recession operation gave a maximum correction of 15 deg. The scleral sutures were never inserted more than 5 mm. behind the original insertion of the internal rectus tendon.

In the group of five cases with end results from 6 deg. to 10 deg. it is likely that a small additional operation would have rendered at least most of these cases straight. In the three treatment cases an additional operation would have been considered worth while, but it was not found possible to persuade the parents that it was necessary.

There were four cases with a residual angle of 10 deg. to 25 deg. In three of these the operation performed was obviously insufficient to correct the total angle. In one case anaesthetic difficulties necessitated stopping operating after a single operation when a double operation was planned. In the second case the original angle was 40 deg. In the third case the original angle

was 30 deg., but the left eye was 14△ higher than the right. Advancement of the left ext. rectus and re-attachment, 2 mm. above the level of the original insertion, reduced the angle to 15 and the height to 5△. Unfortunately, the child's mother was satisfied with the result and refused to consider a second operation, in spite of the fact that this was a treatment case and we hoped for a complete cure in view of the result of the first operation. The last case differed from all the others in its response to operation, and is described in detail below.

The patient was a girl aged 12 years, suffering from left concomitant convergent squint of 20 deg. Her mother and one sister suffered from squint, and at the first interview her mother stated that the squint had started at the age of 18 months, following a "bang on the head." Her home conditions were unhappy.

R.V. with glass (+3·00 sph.+1·00 cyl. 90°)=6/9
L.V. ,, ,, (+2·00 sph.+2·00 cyl. 90°)=Fingers.

After a left advancement of external rectus she was discharged with her eyes straight, and they remained straight until, during a family row two months later, her grandmother pushed her so that the door-knob caught her left eye and gave her a "black eye." The squint recurred, and the angle was 20 deg. as before. Subsequent operation L. recession and R. advancement failed to effect any improvement.

This would appear to be a case of psychological squint. One other case where psychological upset influenced the squint was noted during this series of cases, but the case is not included in the statistics, as no operation was performed. The patient was a girl aged 11 years, suffering from an alternating concomitant squint of 30 deg., which started when she was three years old. There was no family history of squint. Her vision with a +2·00 sph. +2·00 cyl. axis 90 deg. was 6/6 in each eye. The child vomited after each treatment on the synoptophore, and no binocular vision was obtained. On admission to hospital the patient vomited repeatedly, and when she was brought to the operating theatre the squint was found to have disappeared. When seen two weeks after discharge the squint had recurred at its original angle. Nine months later the squint was only present intermittently, and there had been no vomiting since the treatment was discontinued.

In contrast to these two cases are two cases referred from the Child Guidance Clinic for operation, as the children were getting inferiority complexes resulting from the presence of concomitant squint. Both of these cases responded normally to operation.

Five treatment cases were failures owing to the presence of an appreciable residual deviation. Of the remaining 40 cases 28 were able to converge to +25 deg. or over, 8 were able to converge to +20 deg. or over, 2 to +15 deg. only, and 2 moved out of the

Salford area and did not attend for satisfactory post-operative orthoptic treatment.

TREATMENT CASES

Total Cases	Residual angle	Straight Converging to at least 25°	Straight Converging to at least 20°	Straight Convergence below 20°
45	5	28	8	4

Of the 45 cases, 33 were found to be cured in accordance with the severe standard proposed by the British Orthoptic Association.

Four cases in the total series of 100 cases were complicated by difference in height of the two eyes. In two of these over-action of the inferior oblique was present, and operation on this muscle, combined with recession of the internal rectus in one case, resulted in a cure in both. One other case where the height present was reduced by altering the level of re-insertion of the muscle has already been described. In the fourth patient 3 deg. of height followed the operation—recession and advancement. This was the only patient in which troublesome post-operative diplopia occurred, and this was present for 12 months. The difference in height subsequently disappeared and normal binocular vision was obtained, so that the case is included in the list of satisfactory cases.

Marked differences in muscle thickness were found at the time of operation, but it was not found possible to demonstrate any appreciable difference in the response to operation depending on this factor. The increased thickness of muscle found in some children under general anaesthetic may be partly due to individual idiosyncrasy in the response to anaesthetics. In many cases some degree of puffiness of eyelids is present at the end of the anaesthetic, and on dissecting the orbital contents the tissues are found to be slightly oedematous. In exceptional cases, on making the incision over the internal rectus, the conjunctiva is found to be very much increased in thickness. In one case in this series this was found, and the condition was thought to be due to an abnormality of the conjunctiva. Accurate closure of the conjunctiva at the end of the operation was difficult and the end result not very satisfactory.

No cases of granulomata were seen, but in three cases retained black silk advancement sutures incompletely removed by the nurse were subsequently removed without difficulty. No rise of temperature and no undue reaction necessitating prolongation of stay in hospital took place in any patient.

We were fortunate in having the co-operation of the Medical Superintendent of Hope Hospital, so that a small ward was set aside for squint operations, All the children in the ward had their operations on the same morning and were more content to submit to the necessary discipline, as they were all at the same stage of treatment. The squint ward had the additional advantage of permitting us to keep a child with a residual angle for a second operation where necessary—a procedure not always possible in a hospital with a limited number of beds and a large number of acute cases requiring admission.

Summary

1. The result of operative treatment for convergent concomitant squint in 100 cases unsuitable for orthoptic treatment alone is described.

2. Ninety-two of the cases were rendered approximately straight by operation and orthoptics.

3. One patient considered to be a case of psychological squint was unimproved with repeated operation.

4. Of the seven remaining relatively unsatisfactory cases, it is likely that most would have responded to further operation.

5. Of 45 treatment cases with binocular vision at the angle of squint, 33 satisfied the conditions of cure according to the proposed standard of the British Orthoptic Association.

6. Greater co-operation of the parents in allowing a further operation in cases with a residual angle and in bringing the children for post-operative orthoptic treatment would have reduced the number of patients classed as failures from the point of view of normal binocular vision.

A SIMPLIFIED EXTERNAL DACRYOCYSTO-RHINOSTOMY *

BY

Major J. L. D. WILLIAMS, R.A.M.C.,

and

Capt. B. GOODWIN HILL, R.A.M.C.

IN operations designed to establish a short circuit between the lacrymal sac and the nasal cavity, the main efforts have been directed towards establishment of an opening between the two which will not cicatrize and become stenosed. To this end, flaps from the mucuous membrane lining the sac, the nose, or both have

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been utilised and a variety of procedures used to keep them in position. Provided the necessary fine instruments are available for suturing the flaps, these techniques are successful, but when these cannot be used, which is usually the case in a Military Hospital working under active service conditions, a more simplified method is demanded. It may also be that the actual suturing of the mucous membrane is a contributory factor in producing stenosis.

The following is a brief account of a technique which was performed in six cases of dacryocystitis with stenosis of the naso-lacrymal duct. All the patients were negro soldiers, and X-ray photographs taken after the injection of lipiodol into the lacrymal sac *via* the inferior punctum showed stenosis of the naso-lacrymal duct in all. All complained of epiphora and recurrent conjunctivitis. Conservative treatment by means of lavage of the lacrymal sac failed to cure them. The length of history varied between two and four months in five cases, and in one, over twelve months. This case had a fibrotic sac with a small fundus and thickened mucous membrane.

Technique

Exposure of the lacrymal fossa is made by means of a semi-lunar incision, the convexity medial, about $\frac{1}{2}-\frac{3}{4}$ inch long with the centre $\frac{1}{8}$ inch medial to the inner canthus. The median palpebral ligament is divided and the anterior lacrymal crest defined. The medial aspect of the sac is separated from the bony fossa and carefully retracted laterally. An aperture is made with chisels about $\frac{1}{2}$ inch by $\frac{1}{3}$ or even larger in the bony nasal wall, the long axis vertical. This opening is so cut that it lies directly opposite the medial, and not the postero-medial, aspect of the sac fundus. In order to attain this, some of the frontal process of the maxillary bone must be removed, as well as the anterior third of the lacrymal bone. This opening lies in the anterior end of the middle meatus of the nose, the extreme anterior end of the middle turbinate being medial to it. The muco-periosteum of the nose adjoining the opening is removed, no attempt being made to form it into a flap. As large a semi-circular incision as possible is then made in the medial surface of the lacrymal sac, hinged posteriorly, and this flap is turned back to lie over the posterior lip of the opening into the nose.

A piece of rubber tube (the bore approximating as nearly as possible to that of the nasal opening) is taken, and a length of silk-worm gut threaded into one end, by means of a straight needle. The free ends of the silk-worm gut are tied together and the knot passed through the incision and nasal opening into the nasal cavity. The silk-worm gut can now be easily found under the anterior part of middle turbinate by a pair of angular nasal dressing forceps passed up through the nostril, and drawn down, with the rubber

tubing attached, through the anterior nares. The tube must be of such size as to pass through the nasal opening with slight traction, and its upper free end is manipulated to lie in such a way that it projects from the nasal opening into the lacrymal fossa and sac for about three millimetres. In doing so, it serves to keep the flap of tissue from the sac in position as the posterior lip of the newly formed lacrymo-nasal communication. The lower end of the tube, with silk worm gut attached, is cut off flush with the nostril and held in place by means of a strapping dressing until the patient has recovered from the effects of anaesthesia.

The medial palpebral ligament is then repaired by means of a single silk suture (0) and this approximates the anterior cut surface of the lacrymal opening to the anterior lip of the nasal aperture over the rubber tubing—the silk suture passes first through the skin from the lateral side and next through the portion of the incised ligament. The medial cut end, on the anterior lacrymal crest, is next taken in the suture and finally the skin on the medial side. Other sutures (silk) are needed to close the wound completely.

Although the lacrymal sac does not lie in immediate relation to this ligament, it is attached by fibrous expansion and great care must therefore be taken not to expose the anterior aspect of the sac when separating the fundus from the medial wall of the lacrymal fossa.

The post operative treatment consists in one daily syringing through the lower punctum for seven days, after which interval the sutures are removed (this might be done sooner in temperate climates—the present series was done in the tropics where too early removal of sutures often results in breakdown of the wound with secondary sepsis and gaping).

The rubber tubing is not touched until the seventh day, when it is gently removed.

In a country where secondary sepsis is the rule rather than the exception, it was remarkable that healing of the external wound by first intention took place in every case. The skin and subcutaneous tissues in this region seem capable of resisting infection to a marked degree. No nasal complications occurred.

In the six cases operated upon by this method, the immediate results were successful in all but one, mentioned above. In this case no flap of reasonable size could be procured. It is now realised that this type of case should not be subjected to dacryocysto-rhinostomy, at least by this method.

Only two of the cases were examined one month and two months after operation and were free from symptoms. Later results were unfortunately not observed since the patients were soldiers on active service and not available for examination.

The value of pre-operative lipiodol X-ray examination is stressed, as it is important to gain as much information as possible on the

size of the fundus, especially if there has been a previous history of acute inflammation. A preliminary examination of the nasal passages is advisable and if necessary any obstruction due to deflection of the septum should be corrected.

Summary

This describes a simple method of keeping a graft from the lacrymal sac in position in external dacryocystorhinostomy and requires the use of no special instruments other than those provided in the equipment of a Military Hospital.

The use of rubber tubing is introduced to do this (tube drainage of the frontal sinus into the nose is a common procedure and suggested its employment in these cases).

Dacryocystitis, although not a dangerous condition, can cause much inconvenience and any treatment which can alleviate its symptoms has a useful place in surgical procedures, particularly if of a simple nature and requiring no special equipment.

A CASE OF CORPORA NIGRA WITH ANTERIOR SYNECHIA*

BY

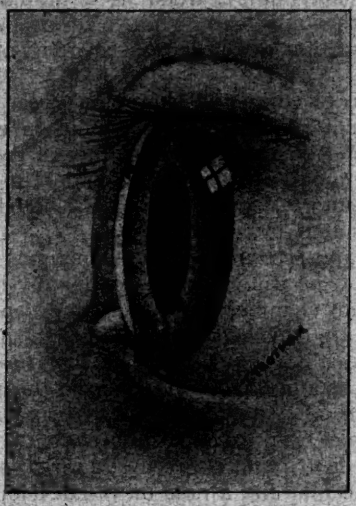
ROBERT CRAWFORD

ROYAL LONDON OPHTHALMIC HOSPITAL

A MAN aged 25 years was recently seen at this hospital; he had never noticed anything strange about his eyes until he complained of dazzling of the left eye in bright sunlight.

He shows in both irides large flocculi or corpora nigra, more marked in the left eye than the right. They are larger on the upper border than the lower, and are not seen along the nasal and temporal sides, following the usual arrangement (Stahli). The especial feature of this case is that one of the upper corpora nigra in the left eye is attached to the back of the cornea. I have been unable to find any reference to this condition in the literature or on personal enquiry, and, subject to correction, believe it to be unique. The flocculus appears to be truly attached to the cornea, not merely lying against it, over a flattened area of some two millimetres diameter, whose position and size remain constant whether the pupil is normal or dilated. The flocculus gives the impression also of being slightly stretched. Near its corneal end it is bifurcated, but the end itself is single. There is no loose pigment in the anterior chamber, which is clear and of normal depth.

* Received for publication, March 1, 1944.



The irides react sluggishly to light and accommodation, which, together with the dazzling due to the anterior synechia, accounts for the patient's difficulty in bright light. The eyes are otherwise normal and clear on transillumination. The vision is right 6/6, and left 6/12, improved to 6/9.

Corpora nigra are seen not infrequently in man, and are of the same origin as those found normally in the horse, sheep, pig, goat and other ungulates. They are dilated portions of the marginal sinus. In the development of the eye invagination of the primary optic vesicle forms the optic cup, which is double-walled. Before the third foetal month the two layers of the optic cup are separated: as the two layers unite, the portion around the rim of the cup remains patent, forming the marginal sinus. It is at first very small, but as the iris develops it increases in size until five months; after this it begins to diminish and is closed at seven months.

This is the normal in man, but sometimes the sinus does not close, and instead becomes dilated into cysts. These flocculi are probably merely dilatations of the normal serrations of the pigmented iris margin: in some cases they are divided up by definite bands, which are strands from the mesoderm of the pupillary membrane.

It is suggested that in this patient one of the flocculi passed through the pupillary membrane about the fifth month, when the marginal sinus is well developed and the anterior chamber is still shallow, and became adherent to the cornea.

The condition may be regarded as a minimal form of maldevelopment of the optic cup; grosser forms are known, which result in the formation of the various degrees of congenital cyst of the eye.

The other form of congenital ectropion uveae is that in which the two ectodermal pigment layers remain in contact but come to lie further round on the anterior surface of the iris than usual. This is ascribed to a simple overgrowth or to dragging of the layers by inflammatory tissue; it is not associated with persistence of the marginal sinus.

Very small grape seed bodies are sometimes seen around the pigment border of the iris. These occasionally become loose and float in the anterior chamber as small, rounded pigmented bodies. That they really are detached corpora nigra is shown by a case of Dymschitz, in which from one half of the iris border they had become detached as a beaded string lying in the anterior chamber, while those of the other half were still in place on the iris.

No treatment has been given to this patient.

Summary.—A description is given of a rare case of iris flocculus with anterior synechia, and a note on the development of flocculi.

REFERENCES

DYMSCHITZ.—*Arch. f. Ophthal.*, Vol. CXXVII, 1931.
MANN.—Development of the Human Eye. Cambridge University Press. 1928.
——— Developmental Abnormalities of the Eye. Cambridge University Press. 1937.
REIS.—Zeitschr. f. Augenheilk., Vol. XXII, 1909.
STAHLI.—*Klin. Monatsbl. f. Augenheilk.*, Vol. LXV, 1920.
VOGT.—Atlas d. Spaltlampenmikroscopie. Berlin. 1931.

UNILATERAL MEMBRANOUS CONJUNCTIVITIS, WITH COMPLETE CAST*

BY

J. F. GALPINE

MEDICAL SUPERINTENDENT, CITY ISOLATION HOSPITAL, COVENTRY

and

DOROTHY R. CAMPBELL

OPHTHALMIC SURGEON, COVENTRY AND WARWICKSHIRE HOSPITAL

THE patient was a girl of six years old, admitted to the City Isolation Hospital on October 11, 1942, with a moderate attack of scarlet fever. The rash was well marked and the throat was injected, with rather extensive semi-confluent follicular exudates on

* Received for publication, June 1, 1944.

both tonsils. She was given 3,000 units of anti-streptococcal serum intramuscularly on the day of admission, and this was followed by a satisfactory resolution of the angina and rash. A routine culture for K.L.B. taken from the nose and throat on October 17 was reported negative.

A severe inflammatory condition of the left eye developed on October 23. There was a great deal of discharge which was suggestive of gonococcal ophthalmia. On closer examination the inner surface of the lids seemed to be coated with early membrane. A culture from the eye was negative for K.L.B. and positive for haemolytic streptococcus, but 8,000 units of anti-diphtheric serum were given on October 25 as a precautionary measure.

On October 26 the eye was examined by one of us (D.R.C.) and it then had the appearance of membranous conjunctivitis. In view of the culture report it was regarded as streptococcal. Frequent irrigations with hydrarg. oxycyan. dil. lotion and oily flavine drops were ordered. The good eye was protected with a Buller's shield. On the following day the sister reported a vaginal discharge. A direct smear was taken, which showed a large number of pus cells with organisms which morphologically resembled gonococci. On being cultured only staphylococcus albus grew. A second report from the eye still showed the presence of streptococci.

By October 31 the membrane was so extensive that it almost hid the cornea, and the latter had become cloudy in its lower half as though suffering from lack of nutrition. The membrane was exactly like chamois leather and extended from the limbus as a complete lining throughout the conjunctival sac. At no time was the pre-auricular gland enlarged. The appearance of the cornea on that day looked as though it could not possibly survive. A further injection of 60,000 units of A.D.S. was given because at this time we could not be certain that the condition was not diphtheritic.

On November 7 the membrane began to separate from the margin of the lower lid, and this separation continued slowly. The cornea was almost hidden, but perception of light was retained. On November 28 the membrane came away as a complete cast. The under surface of the lids was rather red and raw, but healed very rapidly by treatment with saline lotion and cod-liver oil drops.

During the period of separation of the cast the patient was given three injections intramuscularly of T.A.B. 0·1 c.c. on November 6, 0·3 c.c. on November 10, and 0·5 c.c. on November 14. Although the eye condition had subsided by the end of November, there was a recurrence of the vulvovaginitis, and on December 6 there was an increase in the amount of discharge. A vulval smear again showed a large number of gram-negative diplococci, both intra- and extra-cellular, which were indistinguishable from gonococci; the latter, however, were never obtained in cultures.

At the end of her stay in hospital the child developed a high temperature which persisted from December 30 to January 20. No cause was discovered for it, but she was found to be very anaemic. A blood transfusion given on January 18 produced a miraculous improvement in her condition and she was discharged five days later.

In addition to the local treatment of the eye sulphonamides were administered intensively by mouth. Sulphapyridine (3 gm. in 24 hours) was given at the onset of the conjunctivitis, and was replaced by sulphanilamide (6 gm. in 48 hours)—when the conjunctivitis was proved to be streptococcal. Two courses of sulphathiazole were given as a remedy primarily for the attacks of vulvo-vaginitis—the first (35 gm. over 12 days) and the second (36 gm. in 8 days). Finally 18 gm. sulphanilamide was given over 4½ days—during the pyrexial attack, January 12-16.

Both observers were satisfied with the valuable therapeutic effect of the sulphonamides, particularly in combating the severe conjunctivitis and in preventing the onset of panophthalmitis. The vulvitis was evidently more resistant to these drugs.

On February 17 the vision of the left eye had improved to 6/36 partly, and at a subsequent examination of the eye on April 19 she was found to have 6/24 vision in the left eye with a large degree of irregular corneal astigmatism, and no improvement with glasses. There was a slight opacity on the lower half of the cornea, and extensive vascularisation with very small vessels which invaded the cornea from the conjunctiva. The eye was white and appeared quite healthy.

Comment.—This case was considered particularly interesting in view of the fact that, apart from the support of bacteriological evidence, one would have concluded that the eye condition and the vaginal discharge were related, although it is rare for the gonococcus to give rise to a membranous conjunctivitis. If, however, the infection had been gonococcal it is almost certain that the cornea would not have withstood the infection and that panophthalmitis would have developed rapidly in spite of the excellent nursing attention which this case received. It is extremely rare for a streptococcal conjunctivitis to set up such a thick membrane, and still more unusual for it to be discharged from the eye as a complete cast.

Our thanks are due to Dr. A. Massey, Medical Officer of Health for the City of Coventry, for permission to publish this case.

ANNOTATIONS

Corpus onustum
Hesternis vitiis animum quoque praegravat una.

Horace must have had in his mind the effect of the present War on the editors of this Journal when he penned the above words in one of his Satires. Literally translated they mean:—"The body weighted by the excesses of yesterday depresses the intellect at the same time." Our intellect is depressed by the excesses not only of yesterday, but also of last year, and is even more depressed by the fact that what are now "excesses" would, in normal times, just supply that number of calories which would be needed to keep the editorial corpus in a state of active metabolism. Some of our readers may have noted that a paper in our last number was received for publication no less than eight months before it appeared in our pages, and although others have not gone so nearly to full term, it may happen that if the war continues much longer, future papers may have to wait for an even greater time. This does not mean that we would discourage contributions; on the contrary we enjoy the feeling of security given to us by a well filled till under the editorial counter, but we fear that our contributors may be disappointed by having to wait so long for the fruit of their activities to become manifest. We are limited to 56 pages per number, and can no longer expand to 64 or 80 pages, as before the War. It is therefore imperative that authors should be as concise as possible. In the case of papers which cannot be satisfactorily abbreviated, we suggest that the authors should provide abstracts, which might be published instead of, or pending the publication of, the full papers.

Fractures of the Orbit

For clinical convenience the face is divided into thirds. The supra-orbital margin separates the upper from the middle thirds, and the latter ends at the upper teeth. The lower third does not concern the eye surgeon. Fractures of the face are often complex and their treatment frequently requires a combined team, consisting of the neuro-surgeon, the plastic surgeon, the ear, nose and throat specialist, the dental surgeon and dental mechanic, and the eye surgeon. In civil practice such fractures are the result of crush and crash injuries. In war comminution caused by missiles is more bizarre. Priority in surgical handling is sometimes difficult to decide upon. From the plastic point of view it is desirable to reduce a middle third fracture of the face at the earliest opportunity, certainly not to delay longer than 10-12 days, after which time replacement of bone fragments becomes impossible. Early dental assistance is required for fractures implicating the alveolar margin

and teeth, and it is essential to reduce depressed nasal bones and establish an adequate airway with nasal tubes when the nose is involved. The neuro-surgeon may resent such surgical interference and insist on rest to avoid intra-cranial haemorrhage and for the purpose of recovery from cerebral damage.

Unless the eye has a penetrating wound there is no urgency about ophthalmic surgical attention, but it is desirable in the case of fractures of the floor of the orbit to elevate the depressed fragments soon, and so lessen the severity of the diplopia and allow the origin of the inferior oblique muscle to be restored as nearly as it is possible to do so.

Fractures involving the trochlear pulley for the superior oblique tendon should also be dealt with early.

The pattern of fractures of the middle third of the face varies with the direction and force of the blow. Fractures may be disposed centrally involving the nasal bones, the maxilla and the orbit, or laterally in which the malar, zygomatic and orbit are affected. In less severe injuries, either only the nasal bones or the malar are damaged and there is no involvment of the orbit. The central type of fracture frequently runs through the infra-orbital foramen, the infra-orbital fissure and turns medially to pass through either the lacrimal fossa or the os planum of the ethmoid. The naso-lacrimal duct may be involved and dacryocystitis develop subsequently.

At the time of operation the head is placed so that the mid-line of the face is in line with the body and both sides of the face are equally well seen. For the surgeon seated behind the patient it is convenient to have the head tilted slightly backwards. There are two transient disadvantages of this position (1) there is more oozing of blood than if the head is slightly elevated, and (2) blood may flow upwards over the area of operation. However, these are of no appreciable consequence or inconvenience.

The upper buccal sulcus is injected with 1 c.c. of novutox and adrenalin above the pre-molar and first molar teeth, and an incision 2·5 cm. long is then made parallel with the alveolar margin at this site. This incision enters the antrum, the anterior wall of which is generally in-driven. Fragments of bone completely separated from all attachment to periosteum and mucosa are removed, and blood clot is lifted out of the antrum. The surgeon's index finger is then introduced into the antrum, and the fragments of bone forming the infra-orbital margin and the floor of the orbit are felt for and lifted on the finger tip into their normal position, or as near to this as can be obtained.

The antrum is then packed with one inch wide ribbon gauze, which has been soaked in Whitehead's varnish. This gauze pack forms a mould in the antrum. The wound in the upper buccal sulcus is left open. The ribbon gauze is removed in two weeks under sodium pentothal anaesthesia. At the same time inter-nasal

antrostomy is performed to facilitate closure of the buccal sulcus wound and antral wash-outs.

In crush fractures of the malar and zygomatic bones when the bone fragments are depressed, an incision 2 cm. long is made in the temporal fossa along the anterior hair line about half way between the external angular process and the ear. A blunt round-headed elevator is passed downwards on the temporal fascia beneath the anterior end of the zygomatico-malar arch. The blade of the elevator is then lifted forwards and slightly lateralwards as the handle is depressed posteriorly and slightly medial-wards. The operator in holding the handle interposes his fingers between it and the temporal region of the vault of the skull so as to prevent damage to the bone at this site. The depressed fragments of malar and zygomatic bones are levered into position. Position is generally maintained without instrumental aids. This skin incision is closed by 3 or 4 interrupted silk stitches.

In some cases it may be necessary to wire the malar to the malar process of the frontal bone or retain it in position by a wire loop which emerges through the skin, and is attached to a metal device secured to a plaster of Paris bandage around the head.

COUNCIL OF BRITISH OPHTHALMOLOGISTS

AS mentioned in the Council's Annual Report this year, representatives of the Council have recently been negotiating with the Council of the Royal College of Surgeons of England in regard to the institution of a Higher Diploma in Ophthalmology which might meet with general acceptance. As a result of these negotiations, in which the representatives of the Royal College have shown every desire to meet the views of the Council of British Ophthalmologists, it has been agreed to institute such a diploma, and various details have been settled. The following extract from a letter from the President of the Royal College of Surgeons, which was presented to the Council of British Ophthalmologists at its meeting on July 5 shows the result of the negotiations:—

"The Council of the Royal College of Surgeons have given careful consideration to the request of the Council of British Ophthalmologists that they should grant a special diploma of Fellow of the College as a higher diploma in Ophthalmology. They agree with the view that a special examination would be more suitable than the usual Final examination for the Fellowship of the College for those specialising in this important branch of practice. It is also clear to the Council that the present regulations for the 'F.R.C.S. with Ophthalmology' are too exacting, in that candidates for this diploma are required first to have passed the usual Final

Examination of the Fellowship. The Council therefore agree that there should be a special Final Examination for the Fellowship of the College for those specialising in Ophthalmology and that, since the standard of this examination would be comparable with that of the usual Final Examination, successful candidates should rank as Fellows of the College and that there should be no distinction in regard to status or privileges between Fellows thus admitted and those admitted under the present regulations."

"The Council have no right under the existing Charters to make this arrangement but they are prepared to seek powers to grant a diploma of F.R.C.S. in Ophthalmology to candidates who have passed the Primary Examination for the Fellowship and a special Final Examination on the lines submitted by the Council of British Ophthalmologists."

"It is anticipated that two ophthalmic surgeons would be required on the Examining Board and it is proposed that they should be Fellows of the College and additional members of the Court of Examiners. Two other surgical members of the Examining Board would be selected from the general surgeons on the Court of Examiners, and they would take part in some of the oral parts of the Examination."

The Council of British Ophthalmologists received this letter with the utmost satisfaction since it was felt that a useful step forward had been taken both in regularising the qualification required for ophthalmic consultants, and also in bringing Ophthalmologists into still closer connection with the Royal College. Hitherto the academic qualification required for an applicant before appointment as ophthalmologist to a hospital has varied in different parts of the country; with this new development it is hoped that the Fellowship in Ophthalmology will come to be recognised as the desirable qualification for appointment to any Hospital Staff. It is clear that the offer of the Royal College has involved the assumption of an entirely new attitude towards the Diploma of Fellowship, and the Council of British Ophthalmologists feel that general acceptance of the offer will result in benefit to the speciality in many ways.

Another important step by the Royal College will have been noted by those who have read in the Medical Press the announcement by the President concerning representation on the Council of the College. The announcement as contained in the letter to the Honorary Secretary of the Council of British Ophthalmologists reads as follows:

"The Council of the College regards it as increasingly important to ensure the representation on the Council of branches of practice which at any time have not secured representation by the ordinary process of election. The Council therefore intend to apply for such alterations in the Charters as will enable them to co-opt additional members for this purpose."

"The Council wish to make it clear that the College was founded to promote the science and art of Surgery, and it is to assist in this work that the representation on the Council of appropriate branches of practice is thought desirable. The College is not constituted to deal effectively with social and ethical questions affecting not only Fellows and Members of the College, but all members of the Medical Profession. Such questions pertain to some central authority such as the General Medical Council, or some voluntary intra-professional organisation such as the British Medical Association."

"It is intended to propose that co-opted members may be Fellows *or Members* of the College of the same seniority as that required for those seeking election into the Council; that co-opted members of the Council be appointed annually (after consultation with the bodies representing appropriate branches of practice); that the same individual be not eligible for re-appointment beyond five years; and that co-opted members do not have the right of voting for the election to the office of President or Vice-President."

"These proposals require alterations in the Charters of the College, and application for such alterations will not be accepted until after the war. The Council, however, consider it desirable that they should have, at an early date, the assistance in their deliberations of representatives of those branches of practice not represented by any of the elected members. They have therefore decided forthwith to invite representatives of appropriate branches of practice to attend the meetings of the Council. The Council have not the power to grant voting rights to those invited to attend the meetings of the Council, but these representatives would have every opportunity to express their views."

"I shall be grateful if the Council of British Ophthalmologists will suggest names of a few ophthalmic surgeons who are eligible as Fellows or Members from whom the Council of the College could select the one who seems to them most suitable."

This announcement, again, was sincerely welcomed by the Council of British Ophthalmologists as giving an opportunity for the speciality to keep in close touch with the affairs of the Royal College, and to express its views and opinions in the deliberations of the Council of the College on such matters as specially affect it. The presence of an ophthalmologist on the Council of the College has been a rare event in the past, and the chances of a representative of the speciality being elected by open vote are small, for obvious reasons. In the future ophthalmologists will be assured of regular representation, and the Council of British Ophthalmologists feel that such continuity will be beneficial both to the speciality and to the College. The Council at its meeting submitted the names of four Metropolitan and two provincial ophthalmologists who were eligible, from whom the Council of the Royal College will select one for co-option on to its Council.

ABSTRACTS

I.—SURGICAL OPERATIONS

(1) **Gifford, S. R. (Chicago).—Lens extraction following filtering operations for glaucoma.** *Amer. Jl. Ophthal.*, Vol. XXVI, p. 468, 1943.

(1) **Gifford** describes from the literature a variety of surgical operative techniques for the extraction of cataract in an eye with filtering cicatrix at the filtration angle. The operation he recommends is a corneo-scleral section on the temporal side from 11 to 5 o'clock in the right eye and 2 to 7 o'clock in the left. The section is made either with a Graefe knife or a keratome with enlargement of the wound with scissors. A corneo-scleral stitch is employed and this is also brought out through a hood-shaped conjunctival flap. An iridectomy is performed on the temporal side. Intracapsular extraction is recommended when possible.

Seven cases treated by this method are reported. In one only intra-ocular pressure rose above the level present before cataract operation. No operative complications occurred. In one case there was delayed re-formation of the anterior chamber.

H. B. STALLARD.

(2) **Regan, T. T. (Boston).—Venesection in a case of choroidal haemorrhage following cataract extraction.** *Amer. Jl. Ophthal.*, Vol. XXVI, p. 534, 1943.

(2) **Regan** describes the case of a patient, aged 56 years, suffering from arterial hypertension and diabetes who had lost one eye from intra-ocular haemorrhage after cataract extraction. The remaining eye had a mature cataract. At operation on this eye, after delivery of the lens and iridectomy, a brisk flow of yellowish blood came from behind the iris near the surgical coloboma.

660 c.c. of venous blood were immediately withdrawn. Twenty-six hours later, at the first dressing, the aqueous was clear and the eye white and quiet. There was no evidence of intra-ocular haemorrhage. The visual result was good and has remained so for 13 years since operation.

Venesection seems to have been of value in this case.

H. B. STALLARD.

(3) **Berens, C. and Lontfallah, M. (New York).—Resection of the left inferior oblique muscle at its scleral attachment for post-operative hypotropia and left pseudoptosis.** *Amer. Jl. Ophthal.*, Vol. XXVI, p. 528, 1943.

(3) **Berens** and **Lontfallah** describe a case of paresis of the inferior oblique with left hypotropia of 20 prism degrees, pseudoptosis of 2mm. and 8 degrees of incyclotropia. The inferior oblique

insertion was exposed beneath the external rectus. Exposure was facilitated by a scleral hook and resection of the appropriate part of the muscle was expedited by using a calibrated muscle clamp. A mattress suture of 6—0 nylon is inserted through the muscle belly then through the cut tendon insertion and the episcleral tissues above this.

The pseudoptosis was completely cured but there was some residual right hypertropia of 8 degrees, estropia of 22 prism degrees and incyclotropia of 4 degrees.

The authors consider that hypotropia when dominant in certain fields and especially when associated with a homolateral pseudoptosis should be corrected by resection of the underacting muscle and not by weakening of the contralateral synergist.

H. B. STALLARD.

II.—MISCELLANEOUS

(1) **Sorsby, A. (London).—Tuberculosis and the eye.** *The Practitioner*, p. 79, February, 1944.

(1) The most prevalent form of ophthalmia in childhood is phlyctenulosis. This is probably a collection of reactions to a number of exciting stimuli, but at least 80 per cent. of all cases have a tuberculous basis. Histologically it presents the picture of a non-specific round-cell reaction, and experimentally it is possible to excite phlyctenular reaction by sensitizing an animal to a specific chemical, such as peptone or casein, or to a specific organism, such as the tubercle bacillus or the staphylococcus, and instilling the specific antigen into the conjunctival sac. It is therefore an allergic phenomenon. A high incidence of positive tuberculin reaction is found in affected children. In 84 per cent. of 592 children with phlyctenulosis seen at White Oak Hospital positive Mantoux reactions were obtained against an incidence of 15·3 per cent. in a control series of 900 cases of blepharitis. However, clinical evidence of tuberculous disease in children with phlyctenulosis is exceptional, also phlyctenular disease is uncommon in the course of tuberculous disease in children. In the 592 cases of phlyctenulosis mentioned above no less than 6·4 per cent. had tuberculous lesions, while in the 900 controls there was not a single case. On these and other clinical grounds the conclusion is warranted that phlyctenular ophthalmia is the local expression of tuberculous infection.

Chronic cyclitis and iritis are not uncommon and their aetiology is not always established in any particular case; but if it is assumed that non-specific allergic reactions can occur in the tissues of

tuberculous patients and that this non-specific reaction may take different forms depending on the balance between infection and immunity the outlook is clearer.

A. F. MACCALLAN.

(2) **Pugh, Mary (London).—Orthoptic treatment.** *The Practitioner*, p. 88, February, 1944.

(2) Orthoptic treatment includes all methods of treatment which aim at re-establishing the normal straight position of the two eyes and at developing the normal binocular vision which will keep the eyes in this position. The more obvious condition which calls for treatment is a squint which can be seen; the less obvious is a heterophoria which may later break down into a squint or, if not going as far as that, may yet cause eyestrain and discomfort.

Squints are sometimes present at birth but more often occur between the ages of two and five years. A much smaller number of children develop a squint between the ages of five and ten years. About 50 per cent. of cases result from an error of refraction which can be cured by suitable glasses, if this is not carried out in the mistaken hope that the squint will correct itself, the squint may become permanent and incurable.

Psychological squints may result from some emotional irritation such as jealousy or they may be imitative. Orthoptic training is useless while the psychological disturbance persists.

The first stage in the training is development of visual acuity in the weaker eye to 6/12 by completely covering the other with a patch. When this has been attained the patch may be replaced by an occluder attached to the spectacle frame.

Exercises to develop normal binocular vision are begun on the amblyoscope as soon as the vision of the weaker eye is 6/18 and as soon as the child will co-operate. Some adult squinters develop firm binocular vision by training following operation.

The number of patients who recover normality by training alone is only about 10 to 15 per cent. The result of surgery alone is about 50 per cent. of successes. The combined measures of spectacles, occlusion, orthoptic training and surgery if necessary give between 80 and 90 per cent. successful results.

Patients with a small degree of hypermetropia and astigmatism may wear spectacles to relieve a strain which is really muscular. Such patients may find that they can discontinue glasses when the muscle balance is restored to normal by orthoptic exercises. Presbyopes with exophoria up to the age of about fifty years, in a few cases, may put off the use of correcting glasses by persevering with suitable home exercises, however, presbyopia cannot be staved off indefinitely.

A. F. MACCALLAN.

BOOK NOTICE

A Handbook of Ophthalmology. By HUMPHREY NEAME, F.R.C.S. and F. A. WILLIAMSON-NOBLE, F.R.C.S. Pp. 317, with 12 plates, containing 46 coloured illustrations and 189 text figures. Fifth edition. London: J. and A. Churchill, Limited. 1944. Price, 18s.

That this book has reached its fifth edition, and incidentally its second war-time edition, is a tribute to its popularity with students and general practitioners to whom it is particularly addressed. The authors describe lucidly common disorders of the eye and the illustrations of these are admirable.

Several alterations and additions have been made in the fifth edition. Colonel Harold Williamson, I.M.S. has re-written inflammations of the conjunctiva, including an account of recent work on trachoma and sulphonamide therapy in certain forms of conjunctivitis. Sulphonamide therapy has also received particular attention in the chapter on therapeutics. Penicillin, moulds and bacterial extracts have also been commented on.

Brief descriptions of the following operations have been added:—trans-conjunctival partial myomectomy of the inferior oblique muscle; iridencleisis; the skin-strap operation for ptosis; and Wynne Parry's operation for iridodialysis.

In the chapter dealing with therapeutics there is a useful list of prescriptions for the local treatment of the eye, and these include a lotion containing zinc sulphate which is painless and isotonic with the lacrimal secretion. There is an appendix of the requirements of candidates for admission into the public services, and also a glossary of technical terms. The book is well produced.

CORRESPONDENCE

MUSTARD GAS KERATITIS

To the Editors of THE BRITISH JOURNAL OF OPHTHALMOLOGY.

DEAR SIRS,—Some of your readers may have read the appendix I wrote to the English translation of Henri Sjögren's "A New Conception of Kerato-conjunctivitis Sicca." In this appendix I give a resumé of the latest surgical treatment of this disease and since then, by following up my patients I have been able to confirm the efficiency of this treatment.

Sjögren's disease is one almost exclusively feminine in its affinity, but in males with recurrent corneal ulceration I have found also a definite increase in lacrymal secretion as exhibited by Schirmer's test.

Recently I have seen a senior army officer with a definite history of mustard gas in his eyes during the last war. He still has recurrent corneal ulceration, and a very definitely pathological Schirmer's test.

The point of my letter is this—are the cases of delayed recurrent corneal ulceration following mustard gassing due to deficient lacrymal secretion? Is this deficiency produced by essential shrinking of the conjunctiva and lacrymal gland following the mustard gas burn? If my hypothesis is true and I have no opportunity at the moment of proving it further, then the obvious treatment of recurrent mustard gas keratitis is similar to the treatment of Sjögren's diseases in the female.

I would conclude by asking any of your readers that have a case of recurrent mustard gas keratitis to take its Schirmer's test in both eyes on two separate days and let me know their findings. I would be grateful if these could be accompanied by relevant brief details of the case so that I may correlate all the data supplied.

The day when gas may be used again is imminent, and I feel that the moment is opportune to correlate our findings on this point. I therefore look forward to notes by airgraph (if possible) from every colleague in the British Empire who has a case of recurrent mustard gas keratitis in his care. They will be appreciated and duly acknowledged.

Yours faithfully,

J. BRUCE HAMILTON.

174, MACQUARIE STREET,
HOBART, TASMANIA.
June 7, 1944.

OBITUARY

SIR WILLIAM LISTER, K.C.M.G., K.C.V.O.

IT is with profound regret that we record the death of Sir William Tindall Lister on July 7, 1944. Born in 1868 he was the youngest son of the late Arthur Lister, F.R.S.; Lord Lister was his uncle and Joseph Jackson Lister, F.R.S., his grandfather.

He was of Trinity College, Cambridge, and graduated B.A. in the Natural Sciences Tripos in 1889. In London he joined the Medical School of University College Hospital and took the M.B., B.Ch.

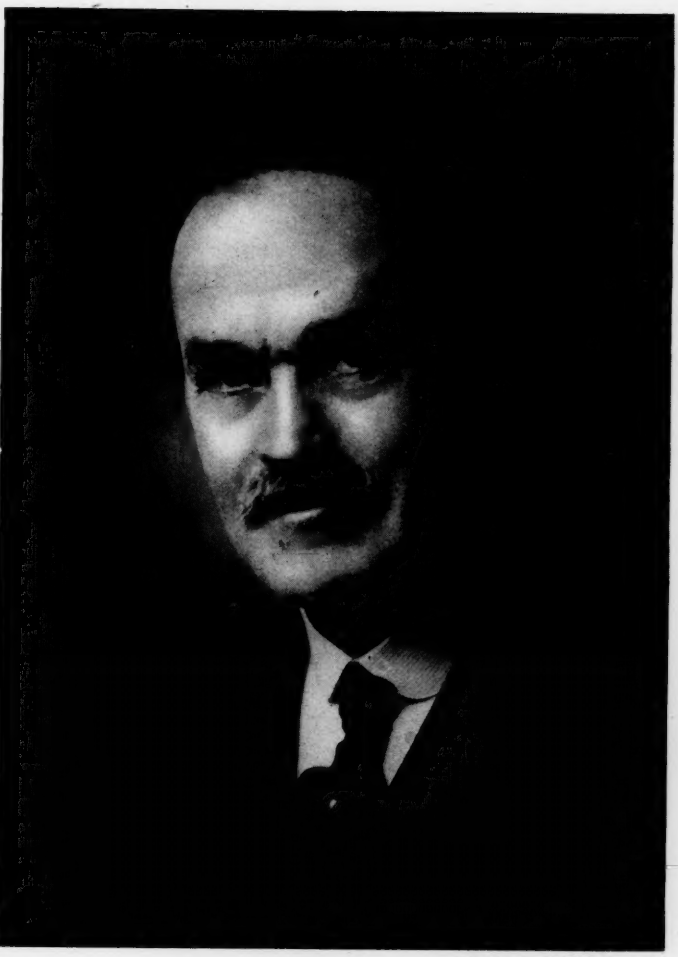


Photo by Alex. Corbett, Baker St., W.1.

SIR WILLIAM LISTER, K.C.M.G., K.C.V.O.

UNIV. OF MICH.

Cantab. in 1892 and the F.R.C.S. Eng. in 1895. Starting work at Moorfields in Sir John Tweedy's clinic he became in due course curator of the Museum and Assistant Surgeon. He also served as ophthalmic surgeon to the London Hospital, but his health at this time was not sufficiently robust to enable him to continue the heavy out-patient work of both clinics and to his great regret he severed his connexion with Moorfields until after the last great war, when he returned to work there and, together with Lady Lister, was chosen a Member of the Committee of Management.

At the outbreak of hostilities in 1914 he was asked to arrange an ophthalmic service for the B.E.F. and was serving overseas in France with the rank of Colonel, A.M.S. until the end of 1918. His services in the army were of the greatest importance and were rewarded with the K.C.M.G. With the late J. F. Cunningham he arranged for the segregation of the Chinese Labour Corps, members of which were heavily infected with trachoma; and their results were highly gratifying. Other honours came to him in after years. In 1934 he was made K.C.V.O. and was chosen consulting ophthalmic surgeon to the King. For many years also he had been oculist to the Royal Household. His enormous practice gave him little time for literary activity, but he published some important papers in the Moorfields Reports and Transactions of the Ophthalmological Society during his curatorship; one of these was on the pathology of interstitial keratitis. To our columns he contributed papers on retinal holes and on concussion injuries in war. His article on mustard gas burns of the eye in the official medical history of the war was another excellent piece of work. And his perimeter eclipsed all previous models and has been in in constant use since it was first designed. Sir William was keenly interested in photography and those who are fortunate enough to possess copies of his beautiful photographs of alpine scenery and foreign churches value them highly. He was a member of the Editorial Committee of the Journal from its start; was a regular attendant at Committee meetings and was of great assistance to the editorial staff.

Whatever Lister undertook he put his whole heart into the doing of it. His standard of work was very high and he was never satisfied with anything short of the best. His innumerable kindnesses to his juniors will never be forgotten by them and his sterling uprightness of character has been an object lesson to us all. British ophthalmology will wish to record its deep sympathy with Lady Lister and her sons.

Sir John Parsons writes:—

I cannot allow the death of my old friend and colleague, to whom I owe more than I have been able to repay, to pass without some

words—inadequate as they are—to testify to my high appreciation of his work and character.

Lister will rank among ophthalmologists as one of the greatest clinicians of his time. To knowledge acquired under the aegis of Tweedy, Nettleship, Gunn, and other members of the Moorfields Eye Hospital staff he brought unbounded enthusiasm, steadfast perseverance, and meticulous accuracy of observation and investigation. His minute attention to detail, combined with excellent technique, stood him in good stead in the delicate manoeuvres of eye surgery, and made him a fine operator. Although naturally of a retiring disposition, in operating and clinical work his strength of character surmounted any hesitations which might otherwise have accrued; he showed the confidence and imperturbability which only mastery of one's subject and oneself provides. He was an excellent teacher, but he shunned the limelight, and though he contributed many important papers to ophthalmic literature he seldom spoke at meetings. His modesty was such that although he was actually elected President of the Ophthalmological Society he declined to accept the honour, much to the disappointment of his colleagues. As Ophthalmic Consultant in France during the last war he did most valuable work.

His chief hobbies were mountaineering—he was a member of the Alpine Club—and photography; in microphotography, mountain, and architectural photography he was in the first rank.

Lister was an idealist and his idealism was fostered by the example of his uncle, Lord Lister, for whom he had the most profound admiration and respect. At no time has the leaven of such characters been more needed than to-day.

Mr. Charles Goulden writes:—

Although I first knew Sir William Lister in 1904 when I became a student at Moorfields, he resigned his position on the Staff so soon that I did not know him well until I became one of his assistants in France during the 1914-18 War. From the date of my arrival in Boulogne until he was laid aside by ill-health, he gave me so much help and encouragement that it was quite impossible for me to repay his generosity.

Lister's work in France was, perhaps, the most important task that he undertook. He organized the work at the Bases so that all eye cases were directed to one hospital and, what was more difficult, established out-patients' departments at those centres where there were spectacle depôts, by means of which a soldier needing glasses was fitted immediately with well-fitting frames and lenses. This was made possible by the ability and business capacity of the late J. H. Sutcliffe who had charge of the distributing headquarters at Clifford's Inn.

Sir William, with the help of the late J. F. Cunningham, acted as the Consultant to the Armies in France, and was constantly visiting the various Bases and Army Ophthalmic Centres. He looked after the interests of all those who worked with him.

His early training as Pathologist at Moorfields led him to make full use of the material which fell into his hands. He made a beautifully mounted collection of eyes that had been removed as the result of perforating wounds. Fortunately this collection was made in duplicate as the specimens deposited at the Royal College of Surgeons were destroyed in 1941.

When operation cases were transferred to England, by a system of labels, they were directed to hospitals that were known to be served by ophthalmic surgeons, and as a result few, if any, cases of sympathetic ophthalmia occurred. It will be appreciated how thoroughly Lister carried out his Army work and it was only an example of the care that he applied to everything he did.

When he returned to England in 1918 he resigned his post at the London Hospital so that he might devote more time to Post-Graduate teaching. He had talent for this. He was well trained in all branches of ophthalmology and had a fine collection of specimens, drawings and photographs. He was elected to Moorfields again in 1919 and threw himself with enthusiasm into his new work. Not only did he spend his energy, but he made generous gifts to the Hospital and Medical School. It is interesting to recall that in December, 1929, he went to Switzerland so as to learn something of the treatment of retinal detachment by ignipuncture. He visited Vogt, Gonin and Koby. In January, 1930, he did the first operation by the then new method, with a view to sealing the hole in the detachment. In March, 1939, he visited Utrecht to see Weve's work. When the date of his retirement came, he was asked to continue his service, a most unusual request, but after about one year he resigned. He and Lady Lister were then elected members of the Committee of Management. They made a large donation to the Hospital with a view to establishing a Convalescent Home; and they were both assiduous in their attendance to hospital business.

Sir William fell into bad health during the last few years so that he was seen at Moorfields less and less and his passing was not unexpected. He was a deeply religious man, with the highest ideals, generous and kind to the less fortunate. He was gifted and versatile, with interest in art, music (he had been a member of the Bach Choir), photography in all its branches, and in his earlier days a mountaineer.

All who knew him will remember him with affection. Requiescat in Pace.

NOTES

Death

DOCTOR CARL HAMBURGER, sometime of Berlin, died in May, 1944, in Gland, near Geneva, where he had found refuge as an exile from Germany in 1939. His studies dealt chiefly with the physiology of nutrition of the eye and with problems of glaucoma. His "Experiences with Glaucosan" were published in the *Brit. Jl. Ophthal.*, for August, 1936.

His wife, the daughter of Prof. Herman Cohn, of Breslau, died in 1942.

* * * *

White Oak Hospital, Swanley

THE following are the admissions recorded for 1942 and 1943:—

	1942	1943
Phlyctenular ophthalmia	121	96
Blepharitis	87	79
Interstitial keratitis	5	10
Trachoma	5	7
Acute conjunctivitis	3	3
Chronic conjunctivitis	16	11
Miscellaneous	24	23
	261	229

In 1942 there were in addition also admitted 128 babies and 98 nursing mothers to the ophthalmia neonatorum block. The corresponding figures for 1943 were 142 and 114. The hospital provided hospitality to 113 nursery babies in 1942 and to 217 in 1943.

* * * *

Corrigendum

DR. MUTCH points out that the legend for *Fig. 4* in his paper on the lacrimation reflex, p. 323, should read "Area of anaesthesia after section of the sensory root of the 5th nerve on the left side," and not as was printed.

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Special Notice

WE are asked by the Ministry of Information to state that the fact that goods made of raw materials in short supply owing to war conditions are advertised in this journal should not be taken as an indication that they are necessarily available for export.